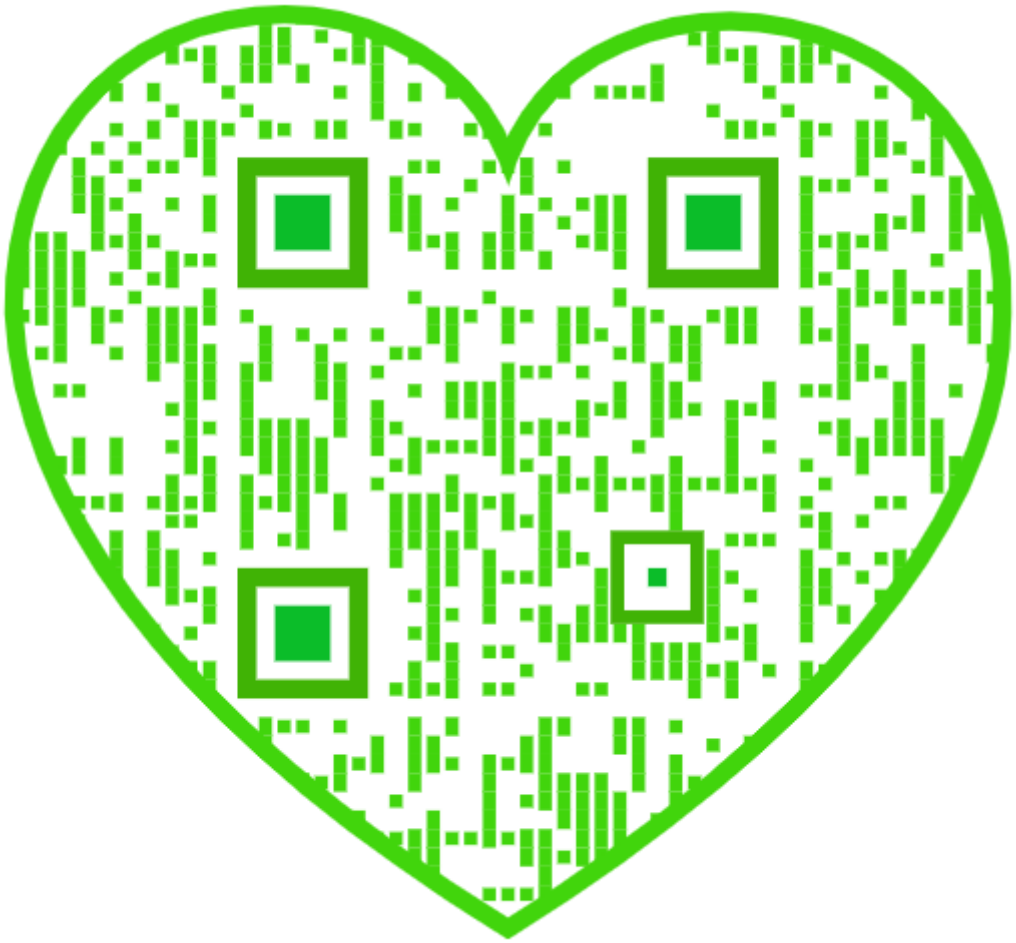

TRANSACTIONS

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS, GYNECOLOGISTS

AND

ABDOMINAL SURGEONS

VOL. XXXIII

FOR THE YEAR 1920

Edited by E. GUSTAV ZINKE, M.D., F.A.C.S.
Cincinnati

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AMERICAN ASSOCIATION OF OBSTETRICIANS, GYNECOLOGISTS, AND ABDOMINAL SURGEONS

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NOTE

The Association does not hold itself responsible for the views enunciated in the papers and discussions published in this volume.

DR. E. GUSTAV ZINKE, *Secretary*,
4 W. SEVENTH AVENUE, CINCINNATI.

[Minutes and discussions stenographically reported by WILLIAM WHITFORD, Chicago, Ill.]

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CONSTITUTION AND BY-LAWS

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS, GYNECOLOGISTS,

AND

ABDOMINAL SURGEONS

TOGETHER WITH

MINUTES OF THE THIRTY-THIRD ANNUAL MEETING

AMERICAN ASSOCIATION

OF

OBSTETRICIANS, GYNECOLOGISTS,

AND

ABDOMINAL SURGEONS

CONSTITUTION

I. The name of this Association shall be THE AMERICAN ASSOCIATION OF OBSTETRICIANS, GYNECOLOGISTS, AND ABDOMINAL SURGEONS.*

II. Its object shall be the cultivation and promotion of knowledge in whatever relates to Obstetrics, Gynecology, and Abdominal Surgery, except that which is peculiar to the male.

MEMBERS

III. The members of this Association shall consist of Ordinary Fellows, Honorary Fellows, Corresponding Fellows, and Senior Fellows.

The Ordinary Fellows shall not exceed one hundred and fifty in number.

The Honorary Fellows shall not exceed ten American and twenty-five foreign.

Candidates shall be proposed to the Executive Council at least three months before the first day of meeting, by two Fellows, and shall be balloted for at the annual meeting, a list of names having been sent to every Fellow with the notification of the meeting.

A two-thirds vote in the affirmative of all the members present shall be necessary to elect—fifteen Fellows at least being in attendance.

All candidates for active fellowship shall submit to the Executive Council, at least three months before the annual meeting, an original paper relating to Obstetrics, Gynecology, or Abdominal Surgery, as indicated in Article II.

HONORARY FELLOWS

IV. The power of nominating Honorary Fellows shall be vested in the Executive Council.

*At the Annual Session held in Atlantic City, September, 1920, the name of the Association was changed as above indicated.

Their election shall take place in the same manner as that of Ordinary Fellows.

They shall enjoy all the privileges of Ordinary Fellows, excepting to vote or hold office, but shall not be required to pay any fee.

CORRESPONDING FELLOWS

V. The Corresponding Fellows shall be recommended by the Executive Council and elected by the Association.

They shall enjoy all the privileges of Ordinary Fellows, excepting to vote or hold office, and shall be entitled to a copy of the annual TRANSACTIONS.

They shall pay an annual fee of five dollars.

SENIOR FELLOWS

Senior Fellows shall be nominated by the Executive Council, and elected by the Association as provided for in the election of Honorary Fellows, and they shall enjoy the same privileges as are accorded Corresponding Fellows.

OFFICERS

VI. The officers of this Association shall be a President, two Vice-Presidents, a Secretary, an Assistant Secretary, a Treasurer, and six Executive Councillors.

The nomination of all officers shall be made in open session at the business meeting, and the election shall be by ballot.

The first five officers shall enter upon their duties immediately before the adjournment of the meeting at which they shall be elected, and shall hold office for one year.

At the election next succeeding the adoption of these laws, the full number of Executive Councillors shall be elected; two for a term of three years, two for a term of two years, and two for a term of one year.

At every subsequent election two Councillors shall be elected for a term of three years, and shall continue in office until their successors shall have been elected and shall have qualified.

Any vacancy occurring during the recess may be filled temporarily by the Executive Council.

ANNUAL MEETINGS

VII. The time and place of holding the annual meeting shall be determined by the Association or may be committed to the Executive Council each time before adjournment.

It shall continue for three days, unless otherwise ordered by vote of the Association.

AMENDMENTS

VIII. This Constitution may be amended by a two-thirds vote of all the Fellows present at the annual meeting: *provided*, that notice of the proposed amendment shall have been given in writing at the annual meeting next preceding: and *provided further*, that such notice shall have been printed in the notification of the meeting at which the vote is to be taken.

AMERICAN ASSOCIATION

OF

OBSTETRICIANS, GYNECOLOGISTS,

AND

ABDOMINAL SURGEONS

BY-LAWS

THE PRESIDING OFFICER

I. The President, or in his absence, one of the Vice-Presidents shall preside at all meetings, and perform such other duties as ordinarily pertain to the Chair.

The presiding officer shall be *ex-officio* chairman of the Executive Council, but shall vote therein only in case of a tie.

SECRETARY

II. The Secretary shall attend and keep a record of all meetings of the Association and of the Executive Council, of which latter he shall be *ex-officio* clerk, and shall be entitled to vote therein.

He shall collect all moneys due from the members, and shall pay the same over to the Treasurer, taking his receipt therefor.

He shall supervise and conduct all correspondence of the Association; he shall superintend the publication of the TRANSACTIONS under the direction of the Executive Council, and shall perform all the ordinary duties of his office.

He shall be the custodian of the seal, books, and records of the Association.

ASSISTANT-SECRETARY

III. The Assistant-Secretary shall assist the Secretary, and shall assume the duties of the latter, should he, for any reason, become incapacitated.

TREASURER

IV. The Treasurer shall receive all moneys from the Secretary, pay all bills, and render an account thereof at the annual meetings, when an

Auditing Committee shall be appointed to examine his accounts and vouchers.

EXECUTIVE COUNCIL

V. The Executive Council shall meet as often as the interests of the Association may require. The President, or any three members may call a meeting, and a majority shall constitute a quorum.

It shall have the management of the affairs of the Association, subject to the action of the house at its annual meetings.

It shall have control of the publications of the Association, with full power to accept or reject papers or discussions.

It shall have control of the arrangements for the annual meetings, and shall determine the order of the reading of papers.

It shall constitute a court of inquiry for the investigation of all charges against members for offences involving law or honor; and it shall have the sole power of moving the expulsion of any Fellow.

ORDER OF BUSINESS

VI. The Order of Business at the annual meetings of the Association shall be as follows:

1. General meeting at 10 o'clock A. M.
   a. Reports of Committees on Scientific Questions.
   b. Reading of Papers and Discussion of the same.
2. One business Meeting shall be held at half-past nine o'clock A. M. on the first day of the session, and another on the evening of the second day (unless otherwise ordered by vote), at which only the Fellows of the Association shall be present. At these meetings the Secretary's record shall be read; the Treasurer's accounts submitted; the reports of Committees on other than scientific subjects offered; and all miscellaneous business transacted.

PAPERS

VII. The titles of all papers to be read at any annual meeting shall be furnished to the Secretary *not later* than one month before the first day of the meeting.

No paper shall be read before the Association that has already been published, or that has been read before any other body.

Not more than thirty minutes shall be occupied in reading any paper before the Association.

Abstracts of all papers read should be furnished to the Secretary at the meeting.

All papers read before the Association shall become its sole property if accepted for publication; and the Executive Council may decline to publish any paper not handed to the Secretary *complete* before the final adjournment of the annual meeting.

QUORUM

VIII. The Fellows present shall constitute a quorum for all business, excepting the admission of new Fellows or acting upon amendments to the Constitution, when not less than fifteen Fellows must be present.

DECORUM

IX. No remarks reflecting upon the personal or professional character of any Fellow shall be in order at any meeting, except when introduced by the Executive Council.

FINANCE

X. Each Fellow, on admission, shall pay an initiation fee of thirty dollars, which shall include his dues for the first year.

Every Fellow shall pay, *in advance* (*i. e.*, at the beginning of each fiscal year) the sum of twenty-five dollars annually thereafter.

[A fiscal year includes the period of time between the first day of the annual meeting and the first day of the next.]

Any Fellow neglecting to pay his annual dues for two years may forfeit his membership, upon the vote of the Executive Council.

The Secretary shall receive, annually, a draft from the President, drawn on the Treasurer, for a sum, to be fixed by the Executive Council, for the services he shall have rendered the Association during the year.

A contingent fund of one hundred dollars shall be placed annually at the disposal of the Secretary for current expenses, to be disbursed by him, and for which he shall present proper vouchers.

ATTENDANCE

XI. Any Fellow who shall neither attend nor present a paper for five consecutive years, unless he offers a satisfactory excuse, shall be dropped from fellowship, upon the vote of the Executive Council.

RULES

XII. *Robert's Rules of Order* shall be accepted as a parliamentary guide in the deliberations of the Association.

AMENDMENTS

XIII. These By-Laws may be amended by a two-thirds vote of the Fellows present at any meeting; *provided* previous notice in writing shall have been given at the annual meeting next preceding the one at which the vote is to be taken.

OFFICERS FOR 1920--1921

PRESIDENT

HENRY SCHWARZ, St. Louis

VICE-PRESIDENTS

BENJAMIN R. McCLELLAN, Xenia, Ohio
JAMES E. KING, Buffalo

SECRETARY

E. GUSTAV ZINKE, Cincinnati

ASSISTANT-SECRETARY

JAMES E. DAVIS, Detroit

TREASURER

HERMAN E. HAYD, Buffalo

EXECUTIVE COUNCIL

CHARLES L. BONIFIELD, Cincinnati
ALBERT GOLDSPOHN, Chicago
JOHN F. ERDMANN, New York
HUGO O. PANTZER, Indianapolis
GEORGE W. CRILE, Cleveland
AARON B. MILLER, Syracuse

LIST OF OFFICERS

From the Organization to the Present

	President	*Vice-Presidents*	*Secretary*	*Treasurer*
1888.	Taylor, Wm. H.	Montgomery, E. E. Carstens, J. H.	Potter, Wm. W.	Werder, X. O.
1889.	Montgomery, E. E.	Myers, W. H. Banta, R. L.	Potter, Wm. W.	Werder, X. O.
1890.	Wright, A. H.	Rohé, G. H. Hall, R. B.	Potter, Wm. W.	Werder, X. O.
1891.	Vander Veer, A.	Hill, H. E. Morris, R. T.	Potter, Wm. W.	Werder, X. O.
1892.	McMurtry, L. S.	Ill, Ed. J. Longyear, H. W.	Potter, Wm. W.	Werder, X. O.
1893.	Rohé, Geo. H.	Manton, W. P. Hulbert, Geo. F.	Potter, Wm. W.	Werder, X. O.
1894.	Carstens, J. H.	Davis, W. E. B. Howitt, H.	Potter, Wm. W.	Werder, X. O.
1895.	Price, Joseph	Cordier, Al. H. Peck, G. S.	Potter, Wm. W.	Werder, X. O.
1896.	Ross, J. F. W.	Johnston, G. B. Sexton, J. C.	Potter, Wm. W.	Werder, X. O.
1897.	Reed, C. A. L.	Douglas, R. Dorsett, W. B.	Potter, Wm. W.	Werder, X. O.
1898.	Ill, Edward J.	Ricketts, Ed. Miller, A. B.	Potter, Wm. W.	Werder, X. O.
1899.	Hall, R. B.	Dunning, L. H. Crofford, T. J.	Potter, Wm. W.	Werder, X. O.
1900.	Davis, W. E. B.	Walker, Ed. Goldspohn, A.	Potter, Wm. W.	Werder, X. O.
1901.	Ricketts, E.	Cumston, C. G. Porter, M. F.	Potter, Wm. W.	Werder, X. O.
1902.	Dunning, L. H.	Rosenwasser, M. Hayd, H. E.	Potter, Wm. W.	Werder, X. O.
1903.	Dorsett, W. B.	Miller, A. B. Haggard, W. D.	Potter, Wm. W.	Werder, X. O.
1904.	Longyear, H. W.	Gilliam, D. T. Brown, J. Y.	Potter, Wm. W.	Werder, X. O.
1905.	Brown, J. Y.	West, J. N. Simpson, F. F.	Potter, Wm. W.	Werder, X. O.
1906.	Morris, R. T.	Crile, G. W. Bonifield, C. L.	Potter, Wm. W.	Werder, X. O.
1907.	Zinke, E. G.	Keefe, J. W. Sellman, W. A. B.	Potter, Wm. W.	Werder, X. O.
1908.	Humiston, Wm. H.	Sadlier, J. E. Davis, J. D. S.	Potter, Wm. W.	Werder, X. O.
1909.	Miller, A. B.	Smith, C. N. Huggins, R. R.	Potter, Wm. W.	Werder, X. O.
1910.	Hayd, H. E.	Schwarz, H. Morris, L. C.	Potter, Wm. W.	Werder, X. O.
1911.	Werder, X. O.	Frank, L. Tate, M. A.	Zinke, E. G.	Hayd, H. E.
1912.	Porter, M. F.	Smith, C. N. Sadlier, J. E.	Zinke, E. G.	Hayd, H. E.
1913.	Smith, C. N.	Pantzer, H. O. Branham, J. H.	Zinke, E. G.	Hayd, H. E.
1914.	Bonifield, C. L.	Davis, A. B. Sanes, K. I.	Zinke, E. G.	Hayd, H. E.
1915.	Pantzer, H. O.	Dickinson, G. K. Pfaff, O. G.	Zinke, E. G.	Hayd, H. E.
1916.	Keefe, J. W.	Ill, Chas. L. Pfaff, Orange G.	Zinke, E. G.	Hayd, H. E.
1917.	Goldspohn, A.	Bainbridge, W. S. Jones, A. T.	Zinke, E. G.	Hayd, H. E.
1918.	Erdmann, J. F.	Weiss, E. A. Yates, H. W.	Zinke, E. G.	Hayd, H. E.
1919.	Crile, G. W.	Findley, P. Hadden, D.	Zinke, E. G.	Hayd, H. E.
1920.	Schwarz, H.	McClellan, B. R. King, J. E.	Zinke, E. G.	Hayd, H. E.

HONORARY FELLOWS

1899.—BALLANTYNE, JOHN WILLIAM, M.D., F.R.C.P.E., F.R.S. Edin. Lecturer on Midwifery and Gynecology, School of Medicine of the Royal Colleges, Surgeons' Hall, Edinburgh; Physician to the Royal Maternity Hospital, Edinburgh; formerly President of the Edinburgh Obstetrical Society; Examiner in Midwifery in the University of Edinburgh; Honorary Fellow of the Glasgow Obstetrical and Gynecological Society. 19 Rothesay Terrace, Edinburgh, Scotland.

1889.—BANTOCK, GEORGE GRANVILLE, M.D., F.R.C.S. Ed. Surgeon to the Samaritan Free Hospital. Broad Meadow, King's Norton, Birmingham, England.

1889.—BARBOUR, SIR A. H. FREELAND, M.A., B.S.C., M.D., F.R.C.P. Ed., F.R.S. Ed. Lecturer on Midwifery and Diseases of Women in the Edinburgh Medical School; Assistant Physician to the Royal Maternity Hospital; Assistant Physician for Diseases of Women to the Royal Infirmary; Physician to the Women's Dispensary; Fellow of the Edinburgh and London Obstetrical Societies, and of the British Gynecological Society; Corresponding Fellow of the Royal Academy of Medicine, Turin. 4 Charlotte Square, Edinburgh, Scotland.

1889.—CROOM, SIR J. HALLIDAY, M.D., F.R.C.P.E., F.R.C.S.E., F.R.S.E. Professor of Midwifery in the University of Edinburgh; Consulting Physician to the Royal Infirmary; Physician to the Royal Maternity Hospital; late President of the Royal College of Surgeons, Edinburgh. 25 Charlotte Square, Edinburgh, Scotland.

1891.—FERNANDEZ, JUAN SANTOS, M.D. Prado, No. 105, Havana, Cuba.

1889.—FREUND, WILLIAM ALEXANDER, M.D. Emeritus Professor and Director of the Clinic for Diseases of Women in the University of Strassburg. Kleiststrasse 9, Berlin W., Germany.

1912.—GILLIAM, DAVID TOD, M.D. Emeritus Professor of Gynecology, Starling-Ohio Medical College; Gynecologist to St. Anthony Hospital; Member of the American Medical Association, Ohio State Medical Association, Columbus Academy of Medicine; Honorary Member of the Northwestern Ohio Medical Association; Ex-president, Franklin County Med-

ical Society; *Vice-president*, 1905. 333 East State Street, Columbus, Ohio.

1894.—JACOBS, CHARLES, M.D. Professor of the Faculty of Medicine of Brussels; Secretary-General of the Permanent Committee of the Periodic International Congress of Gynecology and Obstetrics; Honorary President of the Belgian Society of Gynecology and Obstetrics; Honorary Fellow of the Gynecological Societies of New York and Chicago; Member of the Southern Surgical and Gynecological Association; Corresponding Member of the Gynecological Society of Paris; Surgeon to the Brussels Polyclinic. 53 Boulevard de Waterloo, Brussels, Belgium.

1905.—MCGRAW, THEODORE A., M.D. 73 Cass Street, Detroit, Mich.

1890.—MARTIN, AUGUST, M.D. Emeritus Professor of Gynecology in the University of Greifswald. Keithstrasse 14, Berlin W. 62, Germany.

1897.—MATHEWS, JOSEPH MCDOWELL, M.D. Professor of Diseases of the Rectum and Clinical Surgery, Hospital College of Medicine; President of the Kentucky State Board of Health; President American Medical Association, 1899; 404 Consolidated Realty Bldg., Los Angeles, Cal.

1910.—DE OTT, DIMITRIJ OSKAROVIC. Professor of Obstetrics and Gynecology in the Royal Pavloona Clinical Institute of St. Petersburg; President of the Fifth International Congress of Obstetrics and Gynecology. Wassily Ostrow, University Place, Petrograd, Russia.

1891.—PIETRANERA, E., M.D. Professor of Obstetrics in the Medical Department of the National University; Director of the Maternity Branch of the Clinical Hospital. 2711 Calle Rio Adaria, Buenos Ayres, Argentine Republic, S. A.

1889.—SCHULTZE, BERNHARD SIGMUND, M.D. Professor of Gynecology; Director of the Lying-In Institute and of the Gynecological Clinic. 2 Sellierstrasse, Jena, Germany.

1919.—STANTON, BYRON, M.D. Consulting Obstetrician to Christ Hospital since 1888; Member of American Medical Association, American Public Health Association, Academy of Medicine of Cincinnati (Pres. 1903), Cincinnati Obstetrical Society (Pres. 1883); Member of Ohio State Board of Health, 1892 to 1909 (Pres. 1894, 1901, and 1908); Surgeon, 120th Ohio Voluntary Infantry, 1863-4; Surgeon, U. S. Vols., 1865; Superintendent, Ohio State Hospital, Cleveland, 1865-9. Residence, 6248 Savannah Avenue, Cincinnati, Ohio.

1888.—WILLIAMS, SIR JOHN, BART., M.D., F.R.C.P. Blaen Llynant, Aberystwyth, Cardiganshire, Wales.

Total, sixteen Honorary Fellows.

HONORARY FELLOWS, DECEASED

1892.—Boisliniere, L. Ch., A.B., M.D., L.L.D., Saint Louis, Mo., 1896.

1890.—Championniere, Just. Lucas, M.D., Paris, France, 1913.

1889.—Charpentier, Louis Arthur Alphonse, M.D., Paris, France, 1899.

1888.—Cordes, Auguste E., M.D., Geneva, Switzerland, 1914.

1890.—Corson, Hiram, M.D., Plymouth Meeting, Pa., 1896.

1889.—Dunlap, Alexander, A.M., M.D., Springfield, O., 1894.

1888.—Edis, Arthur Wellesley, M.D., Lond. F.R.C.S., M.R.S.C.S., London, England, 1893.

1889.—Eklund, Abraham Fredrik, M.D., Stockholm, Sweden, 1898.

1891.—Fisher, George Jackson, A.M., M.D., Sing Sing, N. Y., 1893.

1896.—Gaston, James McFadden, A.M., M.D., Atlanta, Ga., 1903.

1892.—Green, Traill, M.D., LL.D., Easton, Pa., 1897.

1889.—Keith, Thomas, M.D., London, England, 1896.

1889.—Leopold, G., M.D., Dresden, Germany, 1913.

1894.—Maclein, Donald, M.D., Detroit, Mich., 1903.

1895.—Mastin, Claudius Henry, M.D., LL.D., Mobile, Ala., 1898.

1891.—Moses, Gratz Ashe, M.D., Saint Louis, Mo., 1901.

1905.—Myers, William Herschel, M.D., Fort Wayne, Ind., 1907.

1889.—Nicolaysen, Julius, M.D., Christiania, Norway, 1915.

1889.—Saenger, Max, M.D., Prague, 1903.

1890.—Savage, Thomas, M.D., F.R.C.S. Eng., Birmingham, England, 1907.

1890.—Segond, Paul, M.D., Paris, France, 1913.

1899.—Sinclair, Sir William Japp, A.M., M.D., Manchester, England, 1913.

1894.—Slaviansky, Kronid, M.D., St. Petersburg, Russia, 1898.

1888.—SMITH, J. GREIG, M.A., C.M., M.B., F.R.S.E., Bristol, England, 1897.

1896.—STERNBERG, GEORGE MILLER, A.M., M.D., LL.D., Washington, D. C., 1915.

1899.—STORRS, MELANCTHON, A.M., M.D., Hartford, Conn., 1900.

1888.—TAIT, LAWSON, M.D., LL.D., F.R.C.S.E., Birmingham, England, 1899.

1905.—TAYLOR, WILLIAM HENRY, M.D., *President*, 1888-1889, Cincinnati, Ohio, 1910.

1900.—THORNTON, J. KNOWSLEY, M.B., M.C., Cambridge, England, 1904.

1901.—WEBER, GUSTAV C. E., M.D., LL.D., Willoughby, Ohio, 1912.

1889.—VON WINKEL, F., M.D., Munich, Germany, 1912.

1905.—WYMAN, WALTER, M.D., Washington, D. C., 1911.

CORRESPONDING FELLOWS

1899.—BEUTTNER, OSCAR, M.D. Professor of the Faculty of Medicine; Directeur de la Clinique gynécologique et obstétricale de l'Université de Geneve. Maison Royale, 46, Quai des Eaux-Vives, Geneva, Switzerland.

1903.—CROZEL, G., M.D. Professor Libre of Gynecology. Collonges au Mont d'Or, Chemin des Celestine, A. Oullins, France.

1914.—DAS, KEDARNATH, M.D. Professor of Midwifery and Gynecology, Campbell Medical School; Obstetrician and Gynecologist, Campbell Hospital, Calcutta; Examiner in Midwifery and Gynecology, Calcutta University; Examiner in Midwifery, College of Physicians and Surgeons, Bengal; Fellow, Royal Society of Medicine, London. 22 Bethune Row, Calcutta.

1903.—ELLIS, GUILHERME, M.D. Chief Surgeon to the Real Sociedade de Beneficencia Portuguese Hospital. 6 Rua Aurora, S. Paulo, Brazil, S. A.

1891.—GRIFFIN, HERBERT SPOHN, B.A., M.B., M.D., C.M. Surgeon to St. Joseph's Hospital; Gynecologist to Hamilton City Hospital; 157 Main Street, Hamilton, Ontario, Canada.

1914.—HERTOGHE, EUGENE, M.D. Antwerp, Belgium.

1903.—LANE, HORACE MANLEY, M.D., LL.D. President of Mackenzie College, S. Paulo, Brazil. 184 Rua da Consolacao, S. Paulo, Brazil, S. A.

1891.—MACHELL, HENRY THOMAS, M.D., L.R.C.P. Ed. Lecturer on Obstetrics, Women's Medical College; Surgeon to St. John's Hospital for Women; Physician to Victoria Hospital for Sick Children and to Hillcrest Convalescent Home. 95 Bellevue Avenue, Toronto, Ontario, Canada.

1898.—WRIGHT, ADAM HENRY, B.A., M.D. Univ. Toronto, M.R.C.S., Eng. Professor of Obstetrics in the University of Toronto; Obstetrician and Gynecologist to the Toronto General Hospital and Burnside Lying-in Hospital, *President*, 1891. 30 Gerrard Street, East, Toronto, Ont., Canada.

Total, nine Corresponding Fellows.

SENIOR FELLOWS

1917.—Howitt, Henry, M.D., M.R.C.S., Eng. F.A.C.S. Senior Surgeon to the Guelph General and St. Joseph's Hospitals, Guelph. Member of the British, Canadian and Ontario Medical Associations. President of the Guelph Association. Vice-president, 1895. 221 Woolwich St., Guelph, Ontario, Canada.

1911.—Lincoln, Walter Rodman, B.A., M.D. Cocoa, Brevard County, Florida.

1919.—Lott, Henry Stokes, M.D. Member of Staff Attending Surgeons; Instructor of Nurses, Obstetrics and Gynecology, City Hospital. Residence, 810 West End Boulevard. Office, 308 Masonic Temple, Winston-Salem, North Carolina.

1917.—Sutcliffe, John Asbury, A.M., M.D., Capt., M.R.C., U. S. Army. Professor of Genito-urinary Surgery, Indiana University School of Medicine; Consulting Surgeon to St. Vincent's Infirmary; Consultant in Genito-urinary Diseases to the City Hospital and to the Protestant Deaconess' Hospital. Residence, 1121 Central Avenue; Office, 155 East Market Street, Indianapolis, Ind.

ORDINARY FELLOWS

1920.—Babcock, William Wayne, A.M., M.D., F.A.C.S. Professor of Surgery, Temple University, Philadelphia; Surgeon, Samaritan, Garretson, and American Stomach Hospitals. Residence, Cloverly Lane, Rydal, Pa.; Office, 2033 Walnut St., Philadelphia, Pa.

1895.—Bacon, Joseph Barnes, M.D., F.A.C.S. Professor of Rectal Diseases at the Post-Graduate Medical School; Instructor in Clinical Surgery in the Medical Department of Northwestern University, Chicago; Surgeon in Chief St. Francis Hospital, Macomb, Ill.

1911.—Bainbridge, William Seaman, M.D., A.M., LL.D., M.S., C.M., Sc.D., Commander, M.C., U.S.N.R.F. (on active duty). Adjunct Professor, New York Post-Graduate Medical School, 1902-6; Professor New York Polyclinic Medical School and Hospital since 1906; Surgeon, New York Skin and Cancer Hospital; Attending Surgeon, New York City Children's Hospitals and Schools; Consulting Surgeon, Manhattan State Hospital, Booth Memorial Hospital, Salvation Army Home and Hospital of New York City, College of Dental and Oral Surgery of New York, and Tarrytown Hospital, Tarrytown, N. Y.; Consulting Gynecologist, St. Andrew's Hospital (New York) and St. Mary's Hospital, Jamaica, Long Island and the Ossining Hospital, Ossining, N. Y.; Honorary President International Congress for Study of Tumors and Cancers, Heidelberg, Germany, 1906; Foreign Member of the Acadamie Royale de Medicine de Belgique; *Vice-president*, 1917-1918. 34 Gramercy Park, New York City.

1895.—Baldwin, James Fairchild, A.M., M.D., F.A.C.S. Memb. Volunteer M.C.; Surgeon to Grant Hospital, 125 South Grant Avenue. Residence, 405 E. Town Street, Columbus, Ohio.

1903.—Bandler, Samuel Wyllis, M.D., F.A.C.S. Instructor in Gynecology in the New York Post-Graduate Medical School and Hospital; Adjunct Gynecologist to the Beth Israel Hospital. Residence and Office, 134 West Eighty-seventh Street, New York, N. Y.

1911.—Barrett, Channing W., M.D., F.A.C.S. Professor of Gynecology and Head of Division of Gynecology, University of Illinois Medical School, Gynecologist and Head of Department of Gynecology, Cook County Hospital. 4245 North Ashland Ave., Chicago, Ill.

1913.—BAUGHMAN, GREER, M.D., F.A.C.S., Capt., M.C., U. S. Army, Honorably Discharged. Professor of Obstetrics, Medical College of Virginia; Visiting Obstetrician to the Stuart Circle Hospital, Virginia Hospital, and to the Memorial Hospital, Richmond, Virginia; Member of the Southern Surgical and Gynecological Association; Vice-president of the Medical Society of Virginia, 1905; President of the Richmond Academy of Medicine and Surgery, 1917; Member of the Tri-State Medical Association of Virginia and the Carolinas; Richmond Academy of Medicine and Surgery, Southern Medical Association and the American Medical Society. Residence and Office, 26 North Laurel St., Richmond, Virginia.

1907.—BELL, JOHN NORVAL, M.D., F.A.C.S., Capt., M.C., U. S. Army. Associate Professor of Obstetrics, Detroit College of Medicine and Surgery; Attending Obstetrician, Providence Hospital; Consulting Obstetrician, Woman's and Booth Memorial Hospitals; Consulting Surgeon, Harper Hospital. Residence, 203 Pallister Avenue; Office, 1149 David Whitney Bldg., Detroit, Mich.

1914.—BILL, ARTHUR HOLBROOK, A.M., M.D., F.A.C.S. Associate Professor and Head of the Department of Obstetrics, School of Medicine, Western Reserve University; Obstetrician in Chief to the Maternity Hospital of Cleveland; Visiting Obstetrician and Department Head, Cleveland City Hospital; Director of the Out-Patient Obstetrical Department, Western Reserve University; Consulting Obstetrician to the Elyria Memorial Hospital, Elyria, Ohio. Residence, 1804 East Ninety-third Street; Office, 503 Osborn Building, Cleveland, Ohio.

1900.—BONIFIELD, CHARLES LYBRAND, M.D. Professor of Gynecology, Medical Department of the University of Cincinnati. Member and Ex-President, Cincinnati Academy of Medicine, Cincinnati Obstetrical Society, Ohio State Medical Association and Ohio Clinical Association. Member of American Medical Association, Southern Surgical and Gynecological Society. *President*, 1914. Residence, 1763 East McMillan Street; Office, 409 Broadway, Cincinnati, Ohio.

Founder.—BOYD, JAMES PETER, A.M., M.D. Emeritus Professor of Obstetrics and Diseases of Children in the Albany Medical College; Consulting Obstetrician to the Albany Hospital; Fellow of the British Gynecological Society; Fellow of the Royal Society of Medicine. 152 Washington Avenue, Albany, N. Y.

1889.—BRANHAM, JOSEPH H., M.D. Professor of Surgery in the Maryland Medical College; Surgeon to the Franklin Square Hospital. 2200 Eutaw Place, corner Ninth Avenue, Baltimore, Md.

1912.—Brown, George Van Amber, M.D. Gynecologist to Providence Hospital; Clinical Instructor in Gynecology, Detroit College of Med. and Surg.; Member Wayne Co. and Michigan State Med. Soc.; Member American Medical Association; President Northern Tri-State Med. Soc. 1918. Residence, 55 Gladstone Avenue; Office, 919 J. Henry Smith Building, Detroit, Mich.

1914.—Brown, William Mortimer, M.D., F.A.C.S. Obstetrician to Rochester General Hospital. Residence and Office, 1776 East Ave., Rochester, N. Y.

1918.—Burckhardt, Louis, M.D. Professor of Obstetrics, Indiana University. Residence, 3159 North Pennsylvania Street; Office, 621 Hume-Mansur Building, Indianapolis, Ind.

1908.—Buteau, Samuel H., M.D., F.A.C.S. Former member of California State Board of Medical Examiners; formerly Visiting Surgeon to Almeda County Hospital. Residence, 1052 Telegraph Avenue; Office; 1155 Broadway, Oakland, Cal.

1914.—Chandler, George Fletcher, M.D., F.A.C.S., Maj., M.C., U. S. Army. Surgeon to the Kingston City Hospital. Residence and Office, 11 East Chestnut St., Kingston, N. Y.

1915.—Clark, Edmund Dougan, M.D., F.A.C.S., Lt. Col. M.C., U. S. A., Commander of Base Hospital No. 32, A. E. F. Professor of Surgery and Secretary of the Faculty, Indiana University School of Medicine; Consulting Surgeon, Indianapolis City Hospital; Visiting Surgeon, Methodist Hospital. Residence, 1321 N. Meridian St.; Office, Hume-Mansur Bldg., Indianapolis, Ind.

1920.—Condit, William Henry, M.D., B.S. Asst. Professor of Obstetrics and Gynecology, University of Minnesota. Residence, 2205 Kenwood Place; Office, Donaldson Bldg., Minneapolis, Minn.

1901.—Crile, George W., A.M., M.D., F.A.C.S., Col. M.C., U. S. Army. Senior Consultant in Surgical Research, American Expeditionary Forces; Professor of Surgery, Western Reserve Medical College; Visiting Surgeon to Lakeside Hospital. *Vice-president*, 1907; *President*, 1920. Residence, 2620 Derbyshire Road, Cleveland Heights; Office, 214 Osborn Bldg., Cleveland, Ohio.

1905.—Crossen, Harry Sturgeon, M.D., F.A.C.S. Clinical Professor of Gynecology in Washington University; Gynecologist to Washington University Hospital; Associate Gynecologist to Mullanphy Hospital; Consulting Gynecologist to Bethesda, City and Female Hospitals. Residence, 4477 Delmar Avenue; Office, 310 Metropolitan Building, Saint Louis, Mo.

1912.—Crotti, André, M.D., F.A.C.S. Capt., M.C., U. S. Army. Professor of Clinical Surgery, Ohio State University; Surgeon to Grant Hospital, Children's Hospital and to St. Francis Hospital. Residence, 1728 E. Broad Street; Office, 151 E. Broad Street, Columbus, Ohio.

1912.—Darnall, William Edgar, A.B., M.D., F.A.C.S. Gynecologist, Atlantic City Hospital; Consulting Surgeon to North American Children's Sanitarium for the Treatment of Surgical Tuberculosis, and Home for Incurables, Longport, New Jersey; Surgeon to the Max and Sarah Bamburger Home, Longport; *Vice-president* American Medical Association, 1914. Residence and Office, 1704 Pacific Ave., Altantic City, N. J.

1911.—Davis, Asa Barnes, M.D., F.A.C.S. Attending Surgeon of the Society of the Lying-in Hospital of the City of New York; Consulting Gynecologist to the Vassar Brothers' Hospital, Poughkeepsie, N. Y. 42 E. 35th Street, New York.

1915.—Davis, James Ethelbert, A.M., M.D. Professor of Pathology, Detroit College of Medicine and Surgery; Director of Laboratories, Providence Hospital and Woman's Hospital; Attending Gynecologist, Providence Hospital; Chief of Staff, William Booth Memorial Hospital. Residence, 111 Josephine Ave., Office, 1229 David Whitney Building; Detroit, Michigan.

1903.—Davis, John D. S., M.D., LL.D., F.A.C.S. Professor of Surgery in the Post-Graduate School of Medicine of the University of Alabama; Surgeon to Hillman Hospital; Surgeon to Davis Infirmary; ex-President Jefferson County Medical Society; *Vice-president*, 1905; *Vice-president*, 1909. 2031 Avenue G, Birmingham, Ala.

1910.—Dice, William Gordon, A.B., M.D. Obstetrician to Flower and Mercy Hospitals. 240 Michigan Street, Toledo, Ohio.

1909.—Dickinson, Gordon K., M.D., F.A.C.S. Attending Surgeon to the Jersey City Hospital, and Christ Hospital, Jersey City; Consulting Surgeon, Bayonne City Hospital, North Hudson Hospital, Weehawken, and the Stumpf Memorial Hospital, Kearny; *Vice-president*, 1915-1916; Past-president, Medical Society of the State of New Jersey, 1919-1920. 280 Montgomery St., Jersey City, N. J.

1920.—Dorsett, Edward Lee, M.D., F.A.C.S., Capt. M.C., U. S. A., 1918-1919. Gynecologist to the Missouri Baptist Sanitarium, Evangelical Deaconess Hospital, and St. Louis City Hospital. Office, 509 University Club Bldg., St. Louis, Mo.

1920.—Douglass, Fred Melvin, M.D. Surgeon to St. Vincent's Hospital; Surgeon to Lucas County Hospital. Residence, 2046 Franklin Ave.; Office, 421 Michigan St. Toledo, Ohio.

1904.—ELBRECHT, OSCAR H., PH. B., M.D., F.A.C.S. Formerly Superintendent and Surgeon in Charge, St. Louis Female Hospital; Visiting Surgeon, St. Louis City Hospital; Consulting Gynecologist, Missouri Pacific Hospital; Consulting Surgeon to St. Louis Maternity Hospital and former Chief of Staff; Consulting Surgeon, Bethesda Hospital; Member of Southern Surgical and Gynecological Association. Residence, Buckingham Hotel; Office, 423 Metropolitan Building, St. Louis, Mo.

1906.—ERDMANN, JOHN FREDERICK, M.D., F.A.C.S. Professor of Surgery, N. Y. Post-Graduate Hospital and Medical School; Attending Surgeon to Gouverneur Hospital and Post-Graduate Hospital; Consulting Surgeon to St. John's Riverside Hospital, Yonkers, N. Y.; Mt. Vernon General Hospital, Mt. Vernon, N. Y.; Greenwich General Hospital, Greenwich, Conn.; Nassau Hospital, Mineola, L. I. 60 West Fifty-second Street, New York, N. Y.

1920.—FARR, ROBERT EMMETT, M.D. Attending Surgeon, St. Mary's Hospital. Residence, 2433 S. Bryant St.; Office, 301 Physicians & Surgeons Bldg., Minneapolis, Minn.

1911.—FINDLEY, PALMER, B.E., M.D., F.A.C.S. Professor of Gynecology, College of Medicine, University of Nebraska. 418 Brandeis Theater Building, Omaha, Neb.

1910.—FOSTER, CURTIS SMILEY, A.B., M.D., F.A.C.S. Gynecologist to the Western Pennsylvania Hospital, Pittsburgh. Residence, 5749 Ellsworth Avenue; Office, 308 Diamond Bank Building, Pittsburgh, Pa.

1903.—FRANK, LOUIS, M.D., F.A.C.S. Professor of Abdominal and Pelvic Surgery, Medical Department, University of Louisville; Surgeon Louisville City Hospital; Surgeon to John N. Norton Memorial Infirmary; Consulting Surgeon, Children's Free Hospital; President Mississippi Valley Medical Association, 1912; *Executive Council*, 1913. Residence, 1321 Fourth Ave.; Office, 400 The Atherton, Louisville, Kentucky.

1912.—FURNISS, HENRY DAWSON, M.D., F.A.C.S., Professor of Gynecology, New York Post-Graduate Hospital; Attending Gynecologist, New York Post-Graduate Hospital; Consulting Gynecologist, All Souls Hospital, Morristown; Consulting Gynecologist, New Rochelle Hospital; Consulting Gynecologist, St. Agnes Hospital, White Plains, N. Y.; Consulting Cystoscopist, New York Infirmary for Women; Fellow, New York Academy of Medicine, New York Medico-Surgical Society, New York Obstetrical Society, New York State and County Medical Societies, American Medical Association, American Urological Society. Residence, 393 West End Ave.; Office, 54 East Forty-eighth Street, New York, N. Y.

1902.—GILLETTE, WILLIAM J., M.D. Professor of Abdominal Surgery and Gynecology in the Toledo Medical College; Surgeon to Robinwood Hospital. 1613 Jefferson Street, Toledo, Ohio.

1895.—GOLDSPOHN, ALBERT, M.S., M.D., F.A.C.S. Professor of Gynecology, Post-Graduate Medical School; Surgeon in Chief of Evangelical Deaconess Hospital. *Vice-president,* 1901. Residence, 2118, Office, 2120 Cleveland Avenue, Chicago, Ill.

1912.—GOODMAN, SYLVESTER JACOB, Ph.G., M.D., F.A.C.S. Surgeon and Obstetrician to Grant Hospital; Obstetrician, Mercy Hospital; Major M.C., U. S. Army, Honorable Discharge. Residence, 1718 Franklin Avenue; Office, 121 South Sixth Street, Columbus, Ohio.

1913.—HADDEN, DAVID, B.S., M.D., F.A.C.S. Residence, 6150 Mendocino Ave.; Office, Oakland Bank and Savings Bldg., Oakland, Cal.

1900.—HAGGARD, WILLIAM DAVID, JR., M.D., F.A.C.S. Professor of Gynecology, Medical Department University of Tennessee; Professor of Gynecology and Abdominal Surgery, University of the South (Sewanee); Gynecologist to the Nashville City Hospital; President of the Nashville Academy of Medicine; Secretary of the Section on Diseases of Women and Obstetrics, American Medical Association, 1898; Fellow (and President) of the Southern Surgical and Gynecological Association; Member of the Alumni Association of the Women's Hospital, N. Y. *Vice-president,* 1904. 148 Eighth Avenue, North, Nashville, Tenn.

1906.—HALL, JOSEPH ARDA, M.D., F.A.C.S., Lieut. Col., M.C., U. S. Army. Clinical Assistant in Gynecology at the Miami Medical College, Cincinnati. 628 Elm Street, Cincinnati, Ohio.

1889.—HALL, RUFUS BARTLETT, A.M., M.D., F.A.C.S. Professor of Clinical Gynecology in the Ohio-Miami Medical College, Medical Department of University of Cincinnati; Gynecologist to the Cincinnati Hospital; Surgeon in charge of the Hall Hospital; Member of the British Medical Society; of the Southern Surgical and Gynecological Association; of the American Medical Association; of the Ohio State Medical Society (President, 1900); of the Cincinnati Academy of Medicine (President, 1909); of the Cincinnati Obstetrical Society (ex-President). *Vice-president,* 1891; *President,* 1900; *Executive Council,* 1904-1909. Berkshire Building, 628 Elm Street, Cincinnati, Ohio.

1902.—HAMILTON, CHARLES SUMNER, A.B., M.D., F.A.C.S. Professor of the Principles of Surgery in Starling Medical College; Surgeon to Mt. Carmel and the Children's Hospitals. 188 E. State St., Columbus, Ohio.

1910.—HARRAR, JAMES AITKEN, M.D., F.A.C.S. Attending Surgeon to the Lying-in Hospital of the City of New York. Residence and Office, 108 East 64th Street, New York, N. Y.

1894.—HAYD, HERMAN EMIL, M.D., M.R.C.S. Eng., F.A.C.S. Surgeon to the German Deaconess Hospital; Surgeon to the German Hospital. *Vice-president,* 1903; *Executive Council,* 1908-1910; *President,* 1911. 493 Delaware Avenue, Buffalo, N. Y.

1908.—HEDGES, ELLIS W., A.B., M.D., F.A.C.S. Visiting Surgeon to Muhlenberg Hospital, Plainfield, N. J. 703 Watchung Avenue, Plainfield, N. J.

1919.—HEWITT, HERBERT WINDHAM, M.D. Attending Surgeon, Grace Hospital; Attending Surgeon, Children's Free Hospital; Associate Professor of Clinical Surgery, Detroit, College of Medicine. Residence, 79 Rowena Street; Office, 1131 David Whitney Bldg., Detroit, Mich.

1910.—HILL, IRA LEON, A.B., M.D. Clinical Instructor of Obstetrics at Cornell University Medical College; Visiting Obstetrician to the Red Cross Hospital; Attending Obstetrician to Sydenham Hospital. 616 Madison Avenue, New York, N. Y.

1905.—HUGGINS, RALEIGH RUSSELL, M.D., F.A.C.S. Surgeon to St. Francis Hospital. *Vice-president,* 1910. 1018 Westinghouse Building, Pittsburgh, Pa.

1895.—HUMISTON, WILLIAM HENRY, M.D. Clinical Professor of Gynecology in the Medical Department of Western Reserve University; Gynecologist in Chief to St. Vincent's Charity Hospital; Consulting Gynecologist to the City Hospital; President of the Ohio State Medical Society, 1898. *Executive Council,* 1902-1903, 1908, 1910-1911. *President,* 1909. Residence, 2041 East Eighty-ninth Street; Office, 536 Rose Building, Cleveland, Ohio.

1901.—ILL, CHARLES L., M.D., F.A.C.S. Surgeon to the German Hospital; Gynecologist to St. Michael's and Surgeon to St. Barnabas's Hospitals, Newark; Gynecologist to All Souls' Hospital, Morristown. 188 Clinton Avenue, Newark, N. J.

Founder.—ILL, EDWARD JOSEPH, M.D., F.A.C.S. Emeritus Surgeon to the Woman's Hospital; Emeritus Medical Director of St. Michael's Hospital; Gynecologist and Supervising Obstetrician to St. Barnabas's Hospital; Consulting Gynecologist to the Beth Israel Hospital of Newark, N. J., to All Souls' Hospital, and Memorial Hospital, Morristown, N. J., and to the Mountain Side Hospital, Montclair, N. J.; Perth Amboy City Hospital, Muhlenberg Hospital (Plainfield), Somerset Hospital (Somerville), Skillman Home for Epileptics, Stumpf Memorial Hospital

(Kearney), St. Elizabeth's Hospital (Elizabeth), and St. James Hospital (Newark); Member of the Southern Surgical and Gynecological Association; Vice-president from New Jersey of the Pan-American Medical Congress of 1893; President of the Medical Society of the State of New Jersey, 1907. *Vice-president*, 1893; *President*, 1899; *Executive Council*, 1901-1903. 1002 Broad Street, Newark, N. J.

1906.—JONAS, ERNST, M.D., F.A.C.S. Clinical Professor of Surgery in Washington University Medical School; Surgeon in Charge of the Surgical Clinic at the Washington University Hospital; Gynecologist to the St. Louis Jewish Hospital; Visiting Surgeon to St. Louis City Hospital; Consulting Surgeon to St. John's Hospital; Surgeon to the Martha Parsons Free Hospital for Children. Residence, 4495 Westminster Place; Office, 465 North Taylor Avenue, St. Louis, Mo.

1910.—JONES, ARTHUR THOMS, M.D., F.A.C.S. Visiting Surgeon to Memorial Hospital, Pawtucket, R. I. and to Rhode Island State Hospital for the Insane, Howard, R. I.; Consulting Surgeon to St. Joseph's Hospital, Providence; and to Woonsocket Hospital, Woonsocket, R. I. Residence, 81 Elm Grove Avenue; Office, 131 Waterman St., Providence, R. I.

1902.—KEEFE, JOHN WILLIAM, M.D., LL.D., F.A.C.S. Attending Surgeon to the Rhode Island Hospital and Providence City Hospital; Consulting Surgeon to the St. Joseph's Hospital, Providence Lying-In Hospital, Memorial Hospital, Pawtucket and Woonsocket Hospital. *Vice-president*, 1908. *Executive Council*, 1911. 262 Blackstone Boulevard, Providence, R. I.

1910.—KENNEDY, JAMES W., M.D., F.A.C.S. Associate Gynecologist and Obstetrician to the Philadelphia Dispensary, 1409 Spruce Street, Philadelphia, Pa.

1911.—KING, JAMES E., M.D., F.A.C.S. Professor of Clinical Gynecology, Medical Department, University of Buffalo, New York; Attending Gynecologist, Buffalo General and Erie County Hospital and Good Samaritan Dispensary; Fellow Royal Society of Medicine, London, England; Fellow of Am. Gyn. Soc., 1248 Main Street, Buffalo, N. Y.

1908.—KIRCHNER, WALTER C. G., A.B., M.D., F.A.C.S., Capt., M.C., U. S. Army. Formerly Superintendent and Surgeon in charge of the St. Louis City Hospital. Visiting Surgeon City Hospital, Consulting Surgeon St. John's Hospital. Office, 508 Metropolitan Building, St. Louis, Mo.

1918.—KOSMAK, GEORGE WILLIAM, A.B., M.D., F.A.C.S. Attending Surgeon, New York Lying-in Hospital; Editor, American Journal of Obstetrics, and Bulletin of New York Lying-in Hospital. Residence and Office, 23 East Ninety-third Street, New York, N. Y.

1898.—LANGFITT, WILLIAM STERLING, M.D., F.A.C.S. Surgeon in chief to St. John's Hospital. Office, 8047 Jenkins Building, Pittsburgh, Pa.

1914.—LEIGHTON, ADAM P., JR., L. M. (Dublin), M.D. Attending Obstetrician to Dr. Leighton's Maternity Hospital, Portland; Gynecologist to Edward Mason Dispensary, Portland; Chairman of the Maine State Board of Registration of Medicine; Consulting Obstetrician to the Webber Hospital, Biddeford; Consulting Obstetrician to the Gardiner General Hospital, Gardiner. Residence, 261 Western Promenade; Office, 192 State Street; Private Hospital, 109 Emery Street, Portland, Maine.

1915.—LITZENBERG, JENNINGS, A.B., M.D., F.A.C.S. Professor of Gynecology and Obstetrics, University of Minnesota. Residence, 3137 Park Avenue; Office, Donaldson Building, Minneapolis, Minn.

1890.—LONGYEAR, HOWARD WILLIAMS, M.D., F.A.C.S. Professor of Gynecology and Abdominal Surgery in the Detroit Post-Graduate Medical School; Clinical Professor of Gynecology in the Detroit College of Medicine; Gynecologist to Harper Hospital; Physician to the Woman's Hospital; President of the Detroit Gynecological Society, 1889; President of the Detroit Surgical Society; Chairman of the Section on Obstetrics and Gynecology of the Michigan State Medical Society, 1892; Chairman Section of Obstetrics and Gynecology and Abdominal Surgery of the American Medical Association 1917. *Vice-president*, 1893; *President*, 1905; *Executive Council*, 1906-1908. Residence, 1699 Jefferson Avenue; Office, 32 Adams Avenue W., Detroit, Mich.

1911.—LOTHROP, EARL P., A.B., M.D., F.A.C.S. Gynecologist to the Buffalo Woman's Hospital; Consulting Surgeon to Columbus Hospital, Buffalo; Surgeon to the J. N. Adams Memorial Hospital for Tuberculosis, Perrysburg, N. Y. 153 Delaware Avenue, Buffalo, N. Y.

1913.—LYNCH, JEROME MORLEY, M.D., F.A.C.S. Professor Rectal and and Intestinal Diseases, New York Polyclinic; Consulting Surgeon Nassau Hospital, Mineola, L. I.; Attending Surgeon St. Mary's Hospital, Hoboken, N. J.; Member New York State and County Societies, American Medical Association, American Proctologic Society, North Western Medical and Surgical Society; Surgeon Medical Reserve, U. S. N. Residence and Office, 205 East 61st St., New York City.

1910.—MCCLELLAN, BENJAMIN RUSH, A.B., A.M., M.D., F.A.C.S. Capt., M.C., U. S. Army, Member American Medical Association; ex-President Ohio State Medical Society; Surgeon to McClellan Hospital. Residence, 636 South Detroit Street; Office, 7 East Second Street, Xenia, Ohio.

1910.—McPherson, Ross, A.B., M.D., F.A.C.S. Attending Surgeon of the Lying-in Hospital of the City of New York; Consulting Obstetrician of the Caledonian Hospital in Brooklyn. Office, 125 East Thirty-ninth Street; Residence, 45 East Sixty-second Street, New York, N. Y.

Founder.—Manton, Walter Porter, M.D., F.A.C.S. Director of Department and Professor of Obstetrics, Detroit College of Medicine and Surgery; Consulting (Emeritus) Gynecologist to Harper Hospital; Gynecologist Pontiac and Traverse City State Hospitals; Consulting Gynecologist to St. Joseph's Retreat; Consulting Director, Herman Kiefer Hospital, Maternity Dept.; Formerly President of the Medical Board and Visiting Obstetrician Woman's Hospital and Infants' Home; President Detroit Academy of Medicine, 1892-1894; President Detroit Gynecological Society, 1890; President Wayne County Medical Society, 1908-1909; Chairman, Section on Obstetrics and Diseases of Women, 1909; Fellow of the Royal Medical Society, the American Gynecological Society, the American College of Surgeons; the Zoological Society of London, etc. *Vice-president,* 1894. 32 Adams Avenue, W., Detroit, Mich.

1914.—Meeker, Harold Denman, A.B., M.D., F.A.C.S., Com., M.C., U. S. N. R. F. Professor of Surgery, Polyclinic Medical School and Hospital, New York; Visiting Surgeon to Park Hospital, New York. Residence, 420 West End Ave.; Office, 47 East 57th St., New York, N. Y.

1920.—Mendenhall, Arthur Monroe, B.S., M.D. Instructor in Obstetrics, Indiana University Medical School. Residence, 3304 Broadway; Office, 333 Newton-Claypool Bldg., Indianapolis, Ind.

Founder.—Miller, Aaron Benjamin, M.D., F.A.C.S. Professor of Gynecology in the Medical Department of Syracuse University; Gynecologist to St. Joseph's Hospital; Consulting Gynecologist to Hospital for Women and Children; Gynecologist to Dispensary. *Vice-president,* 1899, 1904; *President,* 1910; *Executive Council,* 1911. 326 Montgomery Street, Syracuse, N. Y.

1905.—Miller, John D., M.D., F.A.C.S. Professor of Gynecology, University of Cincinnati; Director of Gynecologic Clinic (Out-patient's Dept.), Cincinnati General Hospital; Gynecologist of Good Samaritan and Cincinnati General Hospitals. Residence, N. E. cor. Clifton and McMillan Streets; Office, N. W. cor. Eighth and Elm Streets, Cincinnati, Ohio.

1911.—Moots, Charles W., B.S., M.D., F.A.C.S. Commander, U. S. N. R. F. Gynecologist to Flower Hospital; President of Academy of Medicine of Toledo and Lucas County, 1912. Residence, The Belvedere Apts.; Office 225 Michigan Street, Toledo, Ohio.

1907.—Moriarta, Douglas C., M.D., F.A.C.S. Senior Surgeon to Saratoga Hospital; Surgeon in chief to Saint Christina's Hospital for Children; Director of State Experimental Station at Saratoga. 511 Broadway, Saratoga Springs, N. Y.

1890.—Morris, Robert Tuttle, A.M., M.D., F.A.C.S., Maj., M.R.C., U. S. Army. Professor of Surgery in the New York Post-Graduate Medical School and Hospital. *Vice-president,* 1892; *Executive Council,* 1906, 1908-1911; *President,* 1907. 616 Madison Avenue, New York, N. Y.

1918.—Mosher, George Clark, A.M., M.D,. F.A.C.S. Senior Obstetrician of the Kansas City General and Christian Hospitals; Consulting Obstetrician, Swedish, St. Mary's and Bethany Hospitals; Formerly Professor of Obstetrics and Gynecology, Head of Dept., Medical School of University of Kansas; Founder and ex-President, Kansas City Obstetrical Society. Residence, 361 Locust Street; Office, 605 Bryant Building, Kansas City, Mo.

1896.—Noble, George Henry, M.D., D.C.L., F.A.C.S. Gynecologist to the Grady Hospital; Secretary to the Section on Obstetrics and Gynecology of American Medical Association, 1897; Professor of Clinical Gynecology, Atlanta Medical College (Emery University); Member of the Southern Surgical and Gynecological Association. 186 South Pryor Street, Atlanta, Ga.

1903.—Noble, Thomas Benjamin, M.D. Professor of Abdominal Surgery in the Central College of Physicians and Surgeons; Consultant in the Diseases of Women at the City Hospital, City Dispensary, and Protestant Deaconess's Hospital, Indianapolis. 720 Newton Claypool Building, Indianapolis, Ind.

1907.—Olmsted, Ingersoll, M.D., F.A.C.S. Surgeon to the City and St. Joseph's Hospitals, Hamilton, Ont. 215 South James St., Hamilton, Ontario, Canada.

1899.—Pantzer, Hugo Otto, A.M., M.D., F.A.C.S., Past Professor, Surgical Pathology and Clinical Gynecology, in the Central College of Physicians and Surgeons; Past Professor Clinical Gynecology, Indiana Medical College, Medical Department of Purdue University; Late Professor of Clinical Gynecology in the Indiana Medical College, Medical Department of Indiana University; Gynecologist to Methodist Hospital; Past President of Indianapolis Medical Society; Member of Indiana State Association and American Medical Association. *President,* 1915. 601 Hume-Mansur Bldg., Indianapolis, Ind.

1916.—PECK, GEORGE AUGUSTUS, M.D., F.A.C.S. Attending Surgeon, New Rochelle Hospital, New Rochelle, N. Y.; Consulting Surgeon, Westchester County Hospital, New York. Residence and Office, 189 Centre Ave., New Rochelle, N. Y.

1916.—PERCY, JAMES FULTON, A.M., M.D., F.A.C.S., Maj., M.C., U. S. Army. Office, 2541 First St., San Diego, Cal.

1899.—PFAFF, ORANGE G., M.D. Adjunct Professor of Obstetrics and Diseases of Women in the Medical College of Indiana; Gynecologist to the City, Deaconess's, and St. Vincent's Hospitals, 1337 North Pennsylvania Street, Indianapolis, Ind.

1920.—POLAK, JOHN OSBORN, B.S., M.D., M.Sc. Professor of Obstetrics and Gynecology, Long Island College Hospital; Attending Obstetrician and Gynecologist to the Hospital; Attending Gynecologist to the Jewish Hospital; Consulting Gynecologist, Coney Island, Bushwick, Peoples, Williamsburg, and South Hampton Hospitals; Consulting Obstetrician to the Methodist Episcopal Hospital. Residence, 287 Clinton Ave.; Office, 20 Livingston St., Brooklyn, N. Y.

1898.—PORTER, MILES F., M.D., F.A.C.S., Chairman of the District Conscript Board No. 2, of Indiana. Professor of Surgery in the Indiana University School of Medicine; ex-President Indiana State Medical Society. *Vice-president*, 1902; *President*, 1912-1913. 2326 Fairfield Ave., Ft. Wayne, Ind.

1902.—PORTER, WILLIAM D., M.D. Professor of Clinical Obstetrics, Medical College, University of Cincinnati; Assistant Director, Obstetrical Department, Cincinnati General Hospital. Residence, 3031 Reading Road; Office, 1 Melrose Building, Cincinnati, Ohio.

1914.—POTTER, IRVING WHITE, M.D. Attending Obstetrician, St. Mary's Maternity Hospital; Instructor of Obstetrics, Medical Department, University of Buffalo; Attending Obstetrician, German Deaconess Hospital. Residence and Office, 420 Franklin St., Buffalo, N. Y.

1903.—POUCHER, JOHN WILSON, M.D., F.A.C.S. Consulting Surgeon, Highland Hospital (Beacon, N. Y.), and Hudson River State Hospital (Poughkeepsie); Chief of Staff and Attending Surgeon, Bowne Memorial Hospital, and St. Francis Hospital (Poughkeepsie). 339 Mill Street, Poughkeepsie, N. Y.

1919.—QUIGLEY, JAMES KNIGHT, A.B., M.D. Junior Obstetrician to the Rochester General Hospital. Residence, 400 Westminster Road; Office, 303 Alexander Street, Rochester, N. Y.

1904.—REDER, FRANCIS, M.D., F.A.C.S. Visiting and Consulting Surgeon to St. Louis City Hospital. Residence, 6346 Pershing Avenue; Office, 415 University Club Building, St. Louis, Mo.

Founder.—REED, CHARLES ALFRED LEE, A.M., M.D., F.A.C.S., Maj., M.C., U. S. Army. Consulting Gynecologist, Cincinnati General Hospital; President, American Medical Association, 1900-1; Fellow, British Gynecological Society; Chevalier Legion of Honor, France; Fellow, National Academy of Medicine of Peru; President, Seventh Pan-American Medical Congress. *President,* 1898. Residence, 3544 Biddle Avenue; Office, 5 West Eighth Street, Cincinnati, Ohio.

1913.—RONGY, ABRAHAM JACOB, M.D., F.A.C.S. Attending Gynecologist, Lebanon Hospital; Attending Surgeon, Jewish Maternity Hospital; Consulting Gynecologist, Rockaway Beach Hospital. Residence and Office, 345 West 88th Street, New York City.

1909.—ROSENTHAL, MAURICE I., M.D., F.A.C.S. Surgeon to Saint Joseph's Hospital. 336 W. Berry Street, Fort Wayne, Ind.

1920.—ROYSTON, GRANDISON DELANEY, M.D. Instructor in Clinical Obstetrics, Washington University Medical School; Assistant in Obstetrics, Barnes Hospital; Visiting Staff, St. Louis Maternity Hospital; Chief of Clinic on Obstetrics and Gynecology, Washington University Dispensary. Residence, 3705 Lindell Ave.; Office, Wall Bldg., St. Louis, Mo.

1920.—RUCKER, MARVIN PIERCE, A.M., M.D. Associate in Obstetrics, Medical College of Virginia. Residence, 2020 Monument Ave.; Office, 400 N. Lombardy, Richmond, Va.

1902.—RUNYAN, JOSEPH PHINEAS, M.D. Division Surgeon to the Choctaw, Oklahoma and Gulf Railroad; Secretary of the Arkansas State Medical Association, President, 1904. State Bank Bldg., Little Rock, Ark.

1906.—RUTH, CHARLES EDWARD, M. D., F.A.C.S., Maj., M.R.C., U. S. Army. Professor of Surgery and Clinical Surgery in the Keokuk Medical College (College of Physicians and Surgeons); Surgeon, Iowa M. E. Hospital; Surgeon to Wabash Railway; Chief of Surgical Base Hospital, Camp Dodge, Ia.; Surgeon to the Chicago and Rock Island Pacific Railway. Equitable Bldg., Des Moines, Iowa.

1903.—SADLIER, JAMES EDGAR, M.D., F.A.C.S. Attending Surgeon, St. Francis Hospital, Poughkeepsie, N. Y.; Surgeon-in-Chief, The Sadlier Hospital, Poughkeepsie, N. Y.; Consulting Surgeon, Highland Hospital, Beacon, N. Y. *Vice-president,* 1909. Residence and Office, 295 Mill Street, Poughkeepsie, N. Y.

1909.—SANES, KAY ISADORE, M.D., F.A.C.S., Capt., M.C., U. S. Army. Gynecologist to the West Penn Hospital; Consulting Gynecologist to the Montefiore Hospital, Pittsburgh. Residence, 234 McKee Place; Office, Jenkins Building, Pittsburgh, Pa.

1910.—SCHILDECKER, CHARLES BUSHFIELD, M.D. Assistant Gynecologist to Western Pennsylvania Hospital; Coroner's Physician of Allegheny County. Residence, 414 Rebecca Street; Office, 1105 Park Building, Pittsburgh, Pa.

1904.—SCHWARZ, HENRY, M.D., F.A.C.S. Professor of Obstetrics, Medical Department of Washington University. *Vice-President*, 1911. 440 North Newstead Avenue, St. Louis, Mo.

1918.—SCHWARZ, OTTO H., M.D. Instructor in Clinical Obstetrics, Washington University School of Medicine. Residence, 4947 Laclede Avenue; Office, 820 University Club Building, St. Louis, Mo.

1901.—SCOTT, N. STONE, A.M., M.D., F.A.C.S. Formerly Dean and Professor of Surgery, College of Physicians and Surgeons, Cleveland; Consulting Surgeon to City Hospital; Consulting Surgeon to St. John's Hospital; Surgeon to the Out-patient Department of Cleveland General Hospital. Residence, 531 Prospect Avenue; Office, 603-605 Citizens' Building, Cleveland, Ohio.

1895.—SELLMAN, WILLIAM ALFRED BELT, M.D. Gynecologist to The Biedler and Sellman Sanitarium; Member of the Medical and Chirurgical Faculty of Maryland; also of the Baltimore City Medical Society; also of the American Medical Association; the Gynecological and Obstetrical Association of Baltimore; Physician to The Margaret J. Bennett Home for Young Ladies. *Vice-president*, 1908; *Executive Council*, 1909-1910. 5 East Biddle Street, Baltimore, Maryland.

1899.—SIMPSON, FRANK FARROW, A.B., M.D., F.A.C.S., Lieut. Col., M.C., U. S. Army. Chief Medical Section, Council of National Defense; Chief Section of Medical Industry. Gynecologist to the Allegheny General Hospital; Consulting Gynecologist to the Columbia Hospital. *Vice-president*, 1906. Jenkins Building, Pittsburgh, Pa.

1912.—SKEEL, ARTHUR JULIUS, M.D., F.A.C.S. Assistant Professor of Obstetrics, Western Reserve University; Obstetrician to St. Luke's Hospital; Consulting Obstetrician to the Florence Crittenden Home, Consulting Obstetrician to the Woman's Hospital. Residence and Office, 1834 East 65th Street, Cleveland, Ohio.

1901.—SKEEL, ROLAND EDWARD, M.D., F.A.C.S., M.S., A.M., Major M.C., U. S. Army, Hon. discharged. Formerly Associate Clinical Professor of Gynecology in Western Reserve University; Formerly Gynecologist to St. Luke's, Cleveland, Ohio. Office, 402 Title Insurance Bldg., Los Angeles, Cal.

1910.—SMEAD, LEWIS FREDERIC, A.B., M.D., F.A.C.S. Surgeon to St. Vincent's Hospital, Toledo. Residence, 2921 Parkwood Avenue; Office, 227 Michigan Street, Toledo, Ohio.

1920.—SPEIDEL, EDWARD, M.D., Ph.G. Professor of Obstetrics, University of Louisville; Chief of Obstetrical Staff, Louisville City Hospital. Residence, The Besten; Office, Atherton Bldg., Louisville, Ky.

1902.—STARK, SIGMAR, M.D., F.A.C.S. Professor of Obstetrics and Clinical Gynecology in the Cincinnati College of Medicine and Surgery; Gynecologist to the Jewish Hospital. 1108 East McMillan Street, Cincinnati, Ohio.

1919.—STEIN, ARTHUR, M.D., F.A.C.S. Associate Gynecologist at Lenox Hill and Harlem Hospitals, New York City; Consulting Gynecologist, Hospital for Deformities. Residence and Office, 48 East Seventy-fourth Street, New York, N. Y.

1908.—STEWART, DOUGLAS HUNT, M.D., F.A.C.S. Adjunct Surgeon, O. P. D. Knickerbocker Hospital. Residence, 128 West 86th Street, New York, N. Y.

1911.—STILLWAGEN, CHARLES A., M.D., F.A.C.S. Residence, 5343 Pennsylvania Avenue; Office, 613 Jenkins Building, Pittsburgh, Pa.

1899.—SWOPE, LORENZO W., M.D., F.A.C.S. Surgeon to the Consolidated Traction Company; Chief Surgeon to Wabash Railroad, Pittsburgh Division; Surgeon to Western Pennsylvania Hospital; Surgeon to Passavant Hospital; Member of the Allegheny County Medical Society; Member of the American Medical Association. Residence, 4629 Bayard Street; Office, 1105 Park Building, Pittsburgh, Pa.

1901.—TATE, MAGNUS ALFRED, M.D., F.A.C.S. Professor of Obstetrics Miami Medical College; President, Cincinnati Academy of Medicine, 1905; Obstetrician to the Cincinnati General Hospital and to the Good Samaritan Hospital. 19 West Seventh Street, Cincinnati, Ohio.

1920.—TITUS, PAUL, M.D. Obstetrician, Western Pennsylvania Hospital, St. Margaret Hospital, and City Tuberculosis Hospital, Pittsburgh; Professor of Obstetrics, School of Medicine, University of Pittsburgh. Residence, Adler Court Apts.; Office, 1015 Highland Bldg., Pittsburgh, Pa.

1908.—TORRENCE, GASTON, M.D. Surgeon to St. Vincent's and the Hillman Hospitals in Birmingham. Residence, 2705 Caldwell Avenue; Office, 325 Woodward Building, Birmingham, Ala.

1917.—TOVEY, DAVID WILLIAM, M.D. Adjunct Professor of Gynecology, N. Y. Polyclinic Medical School; Gynecologist N. Y. Polyclinic Hospital; Gynecologist Harlem Dispensary. Residence and Office, 240 Riverside Drive, New York, N. Y.

1919.—TRACY, STEPHEN E., M.D., F.A.C.S. Gynecologist, Stetson and Gynecean Hospitals; Consulting Gynecologist, Jewish Maternity Hospital. Residence, 615 Sixty-fifth Ave.; Office, 1527 Spruce Street, Philadelphia, Pennsylvania.

Founder.—VANDER VEER, ALBERT, A.M., M.D., PH.D., LL.D., F.A.C.S., Member Volunteer M.C. Five years Professor of Anatomy, Thirty-eight years Professor of Surgery, Albany Medical College; Surgeon-in-Chief, Albany Hospital; Consulting Surgeon, South End Dispensary; Consulting Surgeon, Benedictine Hospital, Kingston, N. Y.;Consulting Surgeon, Champlain Valley Hospital, Plattsburgh, N. Y.; Consulting Surgeon, Crippled and Ruptured Children, West Haverstraw, N. Y.; Fellow of the American Surgical Association (President, 1906); Fellow of the British Gynecological Society; Member of the American Medical Association (First Vice-president and President, 1915); Member of the Southern Surgical and Gynecological Association; Corresponding Member of the Boston Gynecological Society; Vice-Chancellor of the Board of Regents of the University of the State of New York. *Executive Council*, 1889-1891, 1895-1905; *President*, 1892. 28 Eagle Street, Albany, N. Y.

1913.—VANDER VEER, EDGAR ALBERT, PH.D., M.D., F.A.C.S. Attending Surgeon Albany Hospital; Consulting Surgeon, Champlain Valley Hospital, Plattbsurgh, N. Y. Residence, 150 State St., Office, 28 Eagle St., Albany, N. Y.

1912.—VAN SWERINGEN, BUDD, M.D., Maj., M.R.C., U. S. Army. Gynecologist to the Lutheran Hospital, Surgeon to Pennsylvania Railroad; Formerly Professor of Medicine, Ft. Wayne College of Medicine. 208 Washington Boulevard, Fort Wayne, Indiana.

1909.—WADE, HENRY ALBERT, M.D., F.A.C.S. Visiting Surgeon to Bethany Deaconess's Hospital; Attending Gynecologist to Williamsburg Hospital, Brooklyn. 495 Greene Avenue, Brooklyn, N. Y.

1891.—WALKER, EDWIN, M.D., Ph.D., F.A.C.S. Surgeon to the Walker Hospital; Gynecologist to the Evansville City Hospital; President of the Indiana State Medical Society, 1892; Member of the American Med-

ical Association and of the Mississippi Valley Medical Association; Member of the Southern Surgical and Gynecological Association; First Vice-president American Medical Association, 1907. *Vice-president*, 1901. 712 South Fourth Street, Evansville, Ind.

1907.—WEISS, EDWARD ALOYSIUS, M.D., F.A.C.S., Lieut. Com., M.C., U. S. N. Gynecologist to Mercy Hospital; Gynecologist to Presbyterian Hospital; Obstetrician to Rosalia Maternity Hospital; Assistant Professor of Gynecology at University of Pittsburgh, Medical Department. 714 Jenkins Building, Pittsburgh, Pa.

1914.—WELTON, THURSTON SCOTT, M.D., F.A.C.S. Clinical Instructor of Gynecology and Obstetrics in the Long Island College Hospital; Associate Attending Gynecologist and Obstetrician to the Williamsburgh Hospital; Associate Visiting Gynecologist and Obstetrician to the Greenpoint Hospital; President Brooklyn Medical Society, 1917; Fellow, Brooklyn Gynecological Society. Residence and Office, 842 Union Street, Brooklyn, New York.

1904.—WEST, JAMES NEPHEW, M.D., F.A.C.S. Professor of Diseases of Women and Secretary of the Faculty at the New York Post-Graduate Medical School and Hospital. *Vice-president*, 1906. 71 West Forty-ninth Street, New York.

1896—WESTMORELAND, WILLIS FOREMAN, M.D., F.A.C.S. Professor of Surgery at the Atlanta Medical College. Suite 241, Equitable Building, Atlanta, Ga.

1911.—WHITE, GEORGE R., B.S., M.D., F.A.C.S. Surgeon Part View Sanitarium. 2 Liberty E., Savannah, Ga.

1916.—WING, LUCIUS ARTHUR, B.Sc., M.D., Capt., M.C., U. S. Army, Attending Surgeon, Lying-In Hospital, City of New York; Assisting Surgeon, St. Mary's Free Hospital for Children; Instructor in Clinical Surgery, Cornell University Medical College. Office and Residence, 53 East Sixty-fifth Street, New York, N. Y.

1909.—YATES, H. WELLINGTON, M.D., F.A.C.S. Gynecologist to St. Mary's Hospital; Gynecologist to Providence Hospital; Assistant Professor of Gynecology, Detroit College of Medicine and Surgery; Member of the Section on Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association; Member of the Staff of St. Luke's Hospital; Member of the Wayne County and Michigan State Medical Society; President Detroit Medical Club; Medical Director of the Peninsular Life Insurance Co. Residence, 1360 Fort Street, West; Office, 607 Gas Office Building, Detroit, Mich.

1907.—ZIEGLER, CHARLES EDWARD, A.M., M.D., F.A.C.S. Professor of Obstetrics in the University of Pittsburgh; Medical Director of the Elizabeth Steele Magee Hospital for Women; Medical Director of the Pittsburgh Maternity Dispensary; Consulting Obstetrician to the Columbia Hospital and Consulting Obstetrician and Gynecologist to the Dixmont Hospital for the Insane. 406 Morewood Ave., Pittsburgh, Pa.

1900.—ZINKE, ERNST GUSTAV, M.D., F.A.C.S., Professor of Obstetrics and Clinical Midwifery in the Ohio-Miami Medical College, University of Cincinnati, 1896-1916. Emeritus Professor of Obstetrics, 1916. Consulting Obstetrician to Cincinnati General Hospital. Honorary Chief of Staff, and Obstetrician and Gynecologist to the Deaconess Hospital; President of the Cincinnati Obstetric Society, 1887; President, Academy of Medicine of Cincinnati, 1894; Member and Chairman of Section on Obstetrics, Gynecology, and Abdominal Surgery, American Medical Association, 1914; Member Southern Surgical Association; Honorary Member Jackson County Medical Society, Kansas City, Mo.; Honorary Member, Cincinnati Obstetric Society. *President*, 1908. *Executive Council*, 1909-1911. *Secretary*. 4 West Seventh St., Cincinnati, Ohio.

Total, one hundred and thirty-five Ordinary Fellows.

ORDINARY FELLOWS, DECEASED

1902.—Abrams, Edward Thomas, A.M., M.D., F.A.C.S., Dollar Bay, Mich., 1918.

1890.—Asdale, William James, M.D., Beaver Falls, Pa., 1912.

Founder.—Baker, Washington Hopkins, Philadelphia, Pa., 1904.

1913.—Blume, Frederick, M.D., Pittsburgh, Pa., 1918.

1896.—Bosher, Lewis C., M.D., F.A.C.S., Richmond, Va., 1920.

1894.—Brown, John Young, M.D., F.A.C.S, St. Louis, Mo., 1919.

1889.—Burns, Bernard, M.D., Allegheny, Pa., 1892.

Founder.—Carstens, J. Henry, M.D., F.A.C.S., Detroit, Mich., 1920.

1890.—Coles, Walter, M.D., St. Louis, Mo., 1892.

1889.—Davis, William Elias B., M.D., Birmingham, Ala., 1903.

1892.—Dorsett, Walter Blackburn, M.D., F.A.C.S., St. Louis, Mo., 1915.

1892.—Duff, John Milton, A.M., M.D., Ph.D., Pittsburgh, Pa., 1904.

1898.—Dunn, James C., M.D., Pittsburgh, Pa., 1907.

1892.—Dunning, Lehman Herbert, M.D., Indianapolis, Ind., 1906.

1899.—Eastmann, Thomas Barker, A.B., M.D., F.A.C.S., Indianapolis, Ind., 1919.

1895.—Ferguson, Alexander Hugh, M.D., Chicago, Ill., 1911.

1890.—Frederick, Carlton Cassius, B.S., M.D., Buffalo, N. Y., 1911.

1913.—Freeland, James Roy, M.D., F.A.C.S., Pittsburgh, Pa., 1917.

1891.—Gibbons, Henry, Jr., A.M., M.D., San Francisco, Cal., 1912.

1904.—Goodfellow, George E., M.D., Los Angeles, Cal., 1910.

1913.—Gray, Frank D., M.E.D., M.D., F.A.C.S., Jersey City, N. J., 1916.

1892—Haggard, William David, Sr., M.D., Nashville, Tenn., 1901.

Founder.—Hill, Hampton Eugene, M.D., Saco, Me., 1894.

1912.—Hotaling, Albert Steuben, M.D., Syracuse, N. Y., 1913.

1898.—Hyde, Joel W., M.D., Brooklyn, N. Y., 1907.

1897.—Ingraham, Henry Downer, M.D., Buffalo, N. Y., 1904.

1909.—JACOBSON, JULIUS H., M.D., F.A.C.S., Toledo, O., 1919.

Founder.—JARVIS, GEORGE CYPRIAN, M.D., Hartford, Conn., 1900.

1892.—JELKS, JAMES THOMAS, M.D., Hot Springs, Ark., 1902.

1910.—JENKS, NATHAN, B.S., M.D., F.A.C.S., Detroit, 1916.

Founder.—LOTHROP, THOMAS, M.D., Buffalo, N. Y., 1902.

1900.—LINVILLE, MONTGOMERY, A.B., M.D., New Castle, Pa., 1910.

1896.—LYONS, JOHN A., M.D., Chicago, Ill., 1919.

1891.—MCCANN, JAMES, M.D., Pittsburgh, Pa., 1893.

1898.—MCCANN, THOMAS, M.D., Pittsburgh, Pa., 1903.

1911.—MARVEL, EMERY, M.D., F.A.C.S., Atlantic City, N. J., 1920.

1896.—MOONEY, FLETCHER D., M.D., St. Louis, Mo., 1897.

1894.—MURPHY, JOHN BENJAMIN, A.M., M.D., F.A.C.S., Chicago, Ill., 1916.

Founder.—POTTER, WILLIAM WARREN, M.D., Buffalo, N. Y., 1911.

Founder.—PRICE, JOSEPH, M.D., Philadelphia, Pa., 1911.

1896.—RHETT, ROBERT BARNWALL, JR., M.D., Charleston, S.C., 1901.

1889.—ROHE, GEORGE HENRY, M.D., Baltimore, Md., 1899.

1892.—ROSENWASSER, MARCUS, M.D., Cleveland, O., 1910.

1890.—ROSS, JAMES FREDERICK WM., M.D., C.M., L.R.C.P., Toronto, Ontario, Canada, 1911.

1889.—SEYMOUR, WILLIAM WOTKYNS, A.B., M.D., Troy, N. Y., 1904.

1902.—SIMONS, MANNING, M.D., Charleston, S. C., 1911.

1913.—SMITH, LEWIS W., A.B., M.D., Pittsburgh, Pa., 1917.

1913.—STAMM, MARTIN, M.D., F.A.C.S., Fremont, O., 1918.

1914.—STRASSER, AUGUST ADRIAN, M.D., F.A.C.S., Arlington, N. J., 1918.

Founder.—TOWNSEND, FRANKLIN, A.M., M.D., Albany, N. Y., 1895.

1907.—VANCE, AP MORGAN, M.D., F.A.C.S., Louisville, Ky., 1915.

Founder.—WERDER, XAVIER OSWALD, M.D., F.A.C.S., Pittsburgh, Pa., 1919.

ORDINARY FELLOWS

Classified

ALABAMA

Davis, John D. S.,	2031 Avenue G.,	Birmingham.
Torrance, Gaston,	325 Woodward Bldg.,	Birmingham.

ARKANSAS

Runyan, Joseph Phineas,	State Bank Bldg.,	Little Rock.

CALIFORNIA

Buteau, Samuel H.,	1155 Broadway,	Oakland.
Hadden, David,	Oakland Bank of Savings Bldg.,	Oakland.
Percy, James F.,	2541 First St.,	San Diego.
Skeel, R. E.,	402 Title Insurance Bldg.,	Los Angeles.

CANADA

Howitt, Henry,	221 Woolwich Street,	Guelph, Ontario.
Olmsted, Ingersoll,	215 South James St.,	Hamilton, Ontario.

GEORGIA

Noble, George Henry,	186 South Pryor Street,	Atlanta.
Westmoreland, W. F.,	241 Equitable Bldg.,	Atlanta.
White, George R.,	2 Liberty E.,	Savannah.

ILLINOIS

Bacon, Joseph Barnes,		Macomb.
Barrett, Channing,	4245 N. Ashland Ave.,	Chicago.
Goldspohn, Albert,	34 Washington St.,	Chicago.

INDIANA

Walker, Edwin,	712 South Fourth St.,	Evansville.
Porter, Miles F.,	207 West Wayne St.,	Fort Wayne.
Rosenthal, M. I.,	336 West Berry St.,	Fort Wayne.
Van Sweringen, Budd,	208 Washington Blvd.,	Fort Wayne.
Burckhardt, Louis,	621 Hume-Mansur Bldg.,	Indianapolis.
Clark, Edmund D.,	712 Hume-Mansur Bldg.,	Indianapolis.
Mendenhall, A. M.,	333 Newton-Claypool Bldg.,	Indianapolis.
Noble, Thomas B.,	720 Newton-Claypool Bldg.,	Indianapolis.
Pantzer, Hugo O.,	224 North Meridian St.,	Indianapolis.
Pfaff, O. G.,	1337 North Pennsylvania St.,	Indianapolis.
Suteliff, John A.,	1121 Central Ave.,	Indianapolis.

IOWA

Ruth, Charles E.,	407 Equitable Bldg.,	Des Moines.

KENTUCKY

Frank, Louis,	The Atherton,	Louisville.
Speidel, Edward,	The Atherton,	Louisville.

MAINE

Leighton, Adam P.,	192 State St.,	Portland.

MARYLAND

Branham, Joseph H.,	2200 Eutaw Place,	Baltimore.
Sellman William A. B.,	5 East Biddle St.,	Baltimore.

MICHIGAN

Bell, John Norval,	506 Washington Arcade,	Detroit.
Brown, Geo. Van Amber,	32 Adams Ave., West,	Detroit.
Davis, James E.,	111 Josephine Ave.,	Detroit.
Hewitt, H. W.,	1131 David Whitney Bldg.,	Detroit.
Longyear, H. W.,	32 Adams Ave., W.	Detroit.
Manton, Walter P.,	32 Adams Avenue, West	Detroit.
Yates, H. Wellington,	1360 Fort Street,	Detroit.

MINNESOTA

Condit, William H.,	900 Donaldson Bldg.,	Minneapolis.
Litzenberg, Jennings C.,	Donaldson Bldg.,	Minneapolis.
Farr, Robert E.,	301 Physicans & Surgeons Bldg.	Minneapolis.

MISSOURI

Mosher, G. C.,	605 Bryant Bldg.,	Kansas City.
Crossen, H. S.,	Metropolitan Bldg.,	Saint Louis.
Dorsett, E. Lee,	University Club Bldg.,	Saint Louis.
Elbrecht, Oscar H.,	Metropolitan Bldg.,	Saint Louis.
Jonas, Ernst,	465 North Taylor Ave.,	Saint Louis.
Kirchner, Walter C. G.,	508 Metropolitan Bldg.,	Saint Louis.
Reder, Francis,	415 University Club Bldg.,	Saint Louis.
Royston, G. D.,	Wall Bldg.,	Saint Louis.
Schwarz, Henry,	440 North Newstead Ave.,	Saint Louis.
Schwarz, O. H.,	820 University Club Bldg.,	Saint Louis.

NEBRASKA

Findley, Palmer,	418 Brandeis Theater Bldg.,	Omaha.

NEW JERSEY

Darnall, Wm. Edgar,	1704 Pacific Ave.,	Atlantic City.
Dickinson, Gordon K.,	280 Montgomery St.,	Jersey City.
Ill, Charles L.,	188 Clinton Ave.,	Newark.
Ill, Edward J.,	1002 Broad St.,	Newark.
Hedges, Ellis W.,	703 Watchung Ave.,	Plainfield.

NEW YORK

Boyd, James P.,	152 Washington Ave.,	Albany.
Vander Veer, Albert,	28 Eagle Street,	Albany.
Vander Veer, Edgar A.,	150 State St.,	Albany.
Polak, John O.,	287 Clinton Ave.,	Brooklyn.
Wade, Henry A.,	495 Greene Ave.,	Brooklyn.
Welton, T. Scott,	842 Union St.,	Brooklyn.
Hayd, H. E.,	493 Delaware Ave.,	Buffalo.
King, James E.,	1248 Main St.,	Buffalo.
Lothrop, Earl P.,	153 Delaware Ave.,	Buffalo.
Potter, Irving W.,	420 Franklin St.,	Buffalo.
Chandler, George,	11 East Chestnut St.,	Kingston.
Peck, George A.,	189 Centre Ave.,	New Rochelle.
Bainbridge, W. S.,	34 Gramercy Park,	New York.
Bandler, S. W.,	134 West Eighty-seventh St.,	New York.
Davis, Asa B.,	42 East 35th St.,	New York.
Erdmann, John F.,	60 West Fifty-second St.,	New York.
Furniss, Harry Dawson,	54 East 48th St.,	New York.
Harrar, James A.,	29 East Seventy-seventh St.,	New York.
Hill, I. L.,	616 Madison Ave.,	New York.
Kosmak, G. W.,	23 East 93rd St.,	New York.
Lynch, Jerome Morley,	57 East 52nd St.,	New York.
McPherson, Ross A.,	45 West 62nd St.,	New York.
Meeker, Harold D.,	420 West End Ave.,	New York.
Morris, R. T.,	616 Madison Ave.,	New York.
Rongy, Abraham J.,	345 West 88th St.,	New York.
Stein, Arthur,	48 East 74th St.,	New York.
Stewart, Douglas H.,	128 West 86th St.,	New York.
Tovey, David W.,	240 Riverside Drive,	New York.
West, James N.,	71 West Forty-ninth St.,	New York.
Wing, Lucius A.,	53 East 65th St.,	New York.
Brown, Wm. M.	1776 East Ave.,	Rochester.
Quigley, J. K.,	303 Alexander St.,	Rochester.
Moriarta, Douglas C.,	511 Broadway,	Saratoga Springs.
Sadlier, James E.,	295 Mill St.,	Poughkeepsie.
Poucher, John W.,	339 Mill St.,	Poughkeepsie.
Miller, A. B.,	326 Montgomery St.,	Syracuse.

OHIO

Bonifield, Chas. L.,	409 Broadway,	Cincinnati.
Hall, Joseph A.,	628 Elm St.,	Cincinnati.
Hall, Rufus B.,	628 Elm St.,	Cincinnati.
Miller, John D.,	N.E. Cor. Clifton & McMillan,	Cincinnati.
Porter, W. D.,	Melrose Bldg.,	Cincinnati.
Reed, C. A. L.,	The Groton,	Cincinnati.
Stark, Sigmar,	1108 East McMillan St.,	Cincinnati.
Tate, Magnus A.,	19 West Seventh St.,	Cincinnati.
Zinke, E. G.,	4 West 7th St.,	Cincinnati.
Bill, A. H.,	Osborn Bldg.,	Cleveland.
Crile, George W.,	Osborn Bldg.,	Cleveland.
Humiston, William H.,	536 Rose Bldg.,	Cleveland.
Scott, N. Stone,	603 Citizens Bldg.,	Cleveland.
Skeel, Arthur,	1834 East 65th St.,	Cleveland.

Baldwin, James F.,	405 East Town St.,	Columbus.
Crotti, André,	51 East Broad St.,	Columbus.
Goodman, S. J.,	121 South 6th St.,	Columbus.
Hamilton, Chas. S.,	142 South Garfield St.,	Columbus.
Dice, Wm. Gordon,	240 Michigan St.,	Toledo.
Douglass, Fred M.,	421 Michigan St.,	Toledo.
Gillette, Wm. J.,	1613 Jefferson St.,	Toledo.
Moots, Chas. W.,	225 Michigan St.,	Toledo.
Smead, Lewis F.,	227 Michigan St.,	Toledo.
McClellan, Benjamin R.,	7 East Second St.,	Xenia.

PENNSYLVANIA

Babcock, W. Wayne,	2033 Walnut St.,	Philadelphia.
Kennedy, James W.,	1409 Spruce St.,	Philadelphia.
Tracy, S. E.,	1527 Spruce St.,	Philadelphia.
Foster, Curtis S.,	308 Diamond Bank Bldg.,	Pittsburgh.
Huggins, R. R.,	1018 Westinghouse Bldg.,	Pittsburgh.
Langfitt, William S.,	Jenkins Bldg.,	Pittsburgh.
Sanes, K. I.,	Jenkins Bldg.,	Pittsburgh.
Schildecker, Charles B.,	1105 Park Bldg.,	Pittsburgh.
Simpson, Frank F.,	Jenkins Bldg.,	Pittsburgh.
Stillwagen, Charles A.,	13 Jenkins Bldg.,	Pittsburgh.
Swope, Lorenzo W.,	1105 Park Bldg.,	Pittsburgh.
Titus, Paul,	1015 Highland Bldg.,	Pittsburgh.
Weiss, Edward A.,	714 Jenkins Bldg.,	Pittsburgh.
Ziegler, Chas. E.,	406 Morewood Ave.,	Pittsburgh.

RHODE ISLAND

Jones, Arthur T.,	81 Elm Grove Ave.,	Providence.
Keefe, John W.,	259 Benefit St.,	Providence.

TENNESSEE

Haggard, William D.,	148 Eighth Ave., North,	Nashville.

VIRGINIA

Baughman, Greer,	26 North Laurel St.,	Richmond.
Rucker, M. Pierce,	400 N. Lombardy St.,	Richmond.

MINUTES OF THE PROCEEDINGS

OF THE

THIRTY-THIRD ANNUAL MEETING

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS, GYNECOLOGISTS,

AND

ABDOMINAL SURGEONS

HELD AT

THE AMBASSADOR HOTEL

ATLANTIC CITY, NEW JERSEY

SEPTEMBER 20, 21, AND 22, 1920.

THIRTY-THIRD ANNUAL MEETING

SEPTEMBER 20, 21, AND 22, 1920

The Fellows whose names appear below were present:

BAINBRIDGE, WM. SEAMAN, Commander, U.S.N.R.F. ..... NEW YORK CITY.
BALDWIN, JAMES F. ..... NEW YORK CITY.
BANDLER, SAMUEL W. ..... NEW YORK CITY.
BAUGHMAN, GREER ..... RICHMOND, VA.
BONIFIELD, CHARLES L. ..... CINCINNATI.
BRANHAM, JOSEPH H. ..... BALTIMORE.
BROWN, G. VAN AMBER ..... DETROIT.
BROWN, WILLIAM M. ..... ROCHESTER.
CHANDLER, GEORGE F. ..... KINGSTON, N. Y.
CLARK, EDMUND D. ..... INDIANAPOLIS.
CRILE, GEORGE W. ..... CLEVELAND.
DARNALL, WM. EDGAR ..... ATLANTIC CITY.
DAVIS, JAMES E. ..... DETROIT.
DICE, W. G. ..... TOLEDO.
DICKINSON, GORDON K. ..... JERSEY CITY.
FURNISS, H. DAWSON ..... NEW YORK CITY.
HADDEN, DAVID ..... OAKLAND, CAL.
HARRAR, JAMES A. ..... NEW YORK CITY.
HAYD, HERMAN E. ..... BUFFALO.
HEDGES, ELLIS W. ..... PLAINFIELD, N. J.
HEWITT, HERBERT W. ..... DETROIT.
ILL, EDWARD J. ..... NEWARK.
JONES, ARTHUR T. ..... PROVIDENCE.
KEEFE, JOHN W. ..... PROVIDENCE.
KING, JAMES E. ..... BUFFALO.
KOSMAK, GEORGE W. ..... NEW YORK CITY.
LEIGHTON, ADAM P., JR. ..... PORTLAND, ME.
LITZENBERG, JENNINGS C. ..... MINNEAPOLIS.
LOTT, H. S. ..... WINSTON, N. C.
McCLELLAN,, BENJAMIN R. ..... XENIA, OHIO.
McPHERSON, ROSS ..... NEW YORK CITY.
MEEKER, HAROLD D. ..... NEW YORK CITY.
MILLER, AARON B. ..... SYRACUSE.

MILLER, JOHN D. ..... CINCINNATI.
MORRIS, ROBERT T. ..... NEW YORK CITY.
PECK, GEORGE A. ..... NEW ROCHELLE, N. Y.
PFAFF, ORANGE G. ..... INDIANAPOLIS.
POTTER, IRVING W. ..... BUFFALO.
POUCHER, J. WILSON ..... POUGHKEEPSIE.
QUIGLEY, JAMES K. ..... ROCHESTER.
REDER, FRANCIS ..... ST. LOUIS.
RONGY, ABRAHAM J. ..... NEW YORK CITY.
RUNYAN, JOSEPH P. ..... LITTLE ROCK, ARK.
SADLIER, JAMES E. ..... POUGHKEEPSIE.
SANES, K. ISADORE ..... PITTSBURGH.
SCHWARZ, OTTO H. ..... ST. LOUIS.
SMEAD, LEWIS F. ..... TOLEDO.
TITUS, PAUL ..... PITTSBURGH.
TOVEY, DAVID W. ..... NEW YORK CITY.
TRACY, STEPHEN E. ..... PHILADELPHIA.
VANDER VEER, EDGAR A. ..... ALBANY.
VAN SWERINGEN, BUDD ..... FORT WAYNE.
WEISS, EDWARD A. ..... PITTSBURGH.
WELTON, THURSTON S. ..... BROOKLYN.
WEST, JAMES N. ..... NEW YORK CITY.
YATES, H. WELLINGTON ..... DETROIT.
ZINKE, E. GUSTAV ..... CINCINNATI.
Total, 57.

The following-named registered guests were extended the privileges of the floor and invited to participate in the discussions:

Ashley, Herman E. ..... Buffalo.
Bartlett, Clara K. ..... Atlantic City.
Berner, David ..... Atlantic City.
Boyd, George M. ..... Philadelphia.
Canning, C. H. ..... Atlantic City.
Clark, Coryell ..... Cold Springs, N. Y.
Clark, John D. ..... Wichita, Kan.
Cogill, Lida Stewart ..... Philadelphia.
Coles, Stricker ..... Philadelphia.
Conaway, Walt P. ..... Atlantic City.
Corlan, H. ..... New York City.
Deaner, Helen M. ..... Philadelphia.
Dorsett, E. Lee ..... St. Louis.
Douglass, Fred M. ..... Toledo.
Farr, Robert Emmett ..... Minneapolis.
Feldenstein, Geo. J. ..... Pittsburgh.

Goudiss, A. ..... Philadelphia.
Guion, Edward ..... Atlantic City.
Johnston, James R. ..... Pittsburgh.
Knipe, Normal L. ..... Philadelphia.
Lee, Thomas B. ..... Camden, N. J.
Long, W. H. ..... Philadelphia.
McClure, J. R. ..... Philadelphia.
McKenna, John A. ..... Philadelphia.
Neely, W. K. ..... Philadelphia.
Parke, Wm. E. ..... Philadelphia.
Polak, John Osborn ..... Brooklyn.
Potter, Mary G. ..... New York City.
Proctor, I. M. ..... Raleigh, N. C.
Spurney, A. F. ..... Cleveland.
Stewart, W. Blair ..... Atlantic City.
Strittmatter, I. P. ..... Philadelphia.
Total, 32.

First Day—*Monday, September* 20, 1920

Morning Session.—The Association met in the Grill Room of the Ambassador Hotel at 10 A. M. and was called to order by the President, Dr. George W. Crile, Cleveland, Ohio.

President Crile introduced Mr. Samuel P. Leeds, President of the Chamber of Commerce of Atlantic City, who delivered an address of welcome.

Address of Welcome by Mr. Leeds

Mr. President and Members of the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons: Not long since I had an invitation in engraved form come to my office. On first opening it, I thought it was a wedding invitation, but it stated that I was to make an address of welcome before your Association. I never made an address, Mr. President, in my life. I belong to a society of Quakers, who believe in inspirational settings, and when I look over this audience this morning and realize that you are an association of scientific physicians, my sensation is somewhat like that of the boy who sought a position in a department store. He went to the head of the house and asked if there was a position open for him. He was asked if he had ever studied the Holy Scriptures, and the boy said he had. "Can you recite them?" asked the manager. "Well," the boy said, " a little bit." The manager said, "If I were to give you a position in this store, do you suppose you could back up every transaction you made by some verse in the Holy Scriptures?" The boy replied that he thought he could. The manager said, "I am going to give you a position," and he sent him to the silk counter

as a salesman. He had not been there more than two days before a woman came in and asked the question, "Have you any brown silk?" The boy replied, "Yes, madam." He took down from a shelf a roll of silk, put it on the counter, and said, "This roll of silk is marked one dollar a yard." As a matter of fact, there was no mark on it. The lady said, "That is not good enough; I want something better." He put that roll of silk back on the shelf, took down another one, and told her it was two dollars a yard. She said, "In these days of high prices, I want something still better than that. Have you anything better?" The boy replied, "Yes, madam." He turned and took down the first roll he had shown her for one dollar a yard, put it on the counter, and said, "Madam, this is three dollars a yard," and she replied, "That is exactly what I want." (Laughter.) And she took five yards and paid cash for it. In a few moments the manager rang for the boy and had him brought into his office. When the boy came into his presence, the manager said, "I overheard your conversation with the lady who bought the brown silk. I don't know how you got away with it. Can you back up your transaction with Bible testimony?" The boy replied, "I guess I can, although I have forgotten a little of my knowledge of the Bible." The manager said, "Can you find a passage in the Scriptures to support a transaction such as you made with this lady?" The boy replied, "Yes." "What is it?" The boy answered, "She was a stranger, and I took her in." (Laughter.)

Now, Mr. President, you are in the holiday city of America, the playground of the world. In 1852, 50 people were living here. The first railroad was operated here in 1854, and within one year there were 125 residents in Atlantic City, and a visiting population of 10,000. The first train brought 600 people. In the years between we have grown to a permanent population of 60,000 people with a transient population of 100,000 people, and the high water mark of visitors of 400,000 people was reached on Labor Day in 1917. On that day one railroad carried from Atlantic City 61,000 people from one to eleven o'clock in the evening.

You can imagine, therefore, the number of guests who come here throughout the year. I feel, gentlemen, as President of the Chamber of Commerce of Atlantic City, that it is a great pleasure to welcome this organization to this city, and on behalf of the mayor and of the municipality, I desire to present to you, Mr. President, the key to Atlantic City, because I believe it is in safe hands. (Here Mr. Leeds presented President Crile with a nickle-plated key decorated with a blue silk ribbon.)

I believe, gentlemen, while you are here you will have a good time, and everything will be wide open to you. Atlantic City is not so wide open, however, as you think or have been led to believe by the newspapers.

Atlantic City is well governed, and those of us here are glad to give a portion of our lives to the uplift of the municipality. More of us are devoted to the upbuilding and interests of this city, and by giving a portion of our time to its betterment we have made it what it is known today the world over.

In giving you this key, Mr. President, I hope you will use it freely and come again. (Applause.)

THE PRESIDENT.—This key is available for all members who need it. (Laughter.)

We shall now have an address of welcome on behalf of the local medical profession by Dr. H. T. Harvey, President of the Atlantic County Medical Society.

ADDRESS OF WELCOME BY DR. HARVEY

MR. PRESIDENT and Members of the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons: It gives me great pleasure, as President of the Atlantic County Medical Society, to welcome you to this city. If there is anything we can possibly do for you while you are here, we shall be glad to do it. Nothing will be left undone to entertain you while you are with us and to make your visit as pleasant and agreeable as possible. When Dr. Darnall takes hold of a thing, we know it goes through. If there is anything we can do for you, do not hesitate to call upon us. We have been very fortunate in having many conventions of this sort meet here. It is a good thing to have an opportunity several times a year to have men like the members of this association assemble for the purpose of exchanging ideas. Atlantic City does not become tired of having such men hold their meetings here. We get great benefit and instruction from them. I hope that with such arrangements as Dr. Darnall has made all of you may be made to feel at home, and you will want to come back again. In the words of Mr. Dooley, "May you all live forever and die happy." (Laughter and applause.)

In the absence of Dr. Palmer Findley and Dr. David Hadden, who were to have responded to the addresses of welcome, President Crile called upon Dr. Gordon K. Dickinson, Jersey City, New Jersey, to perform this pleasant function.

RESPONSE BY DR. DICKINSON

MR. PRESIDENT and Members of the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons: There is no place in the world which can be compared with Atlantic City. I have had the pleasure of visiting nearly all the watering places on the other side, which have very elaborate hotels and chilly, poor beaches, with not much fun, and the people call them resorts, but no country in the world has beaches

like that of Atlantic City and the one over in California. I am sure, as ex-president of the Medical Society of the State of New Jersey, I can join with the County Medical Society here in giving you a cordial welcome. I really feel you ought to come here every other year, just as the American Medical Association does. It might be cheap for our pocketbooks and save us a long, dusty trip to some other city. Your acoustics are better; your throats are better. You cannot get any booze. You cannot have any diversions, and you are free to do as you please. We heartily welcome you to Atlantic City. (Applause.)

THE PRESIDENT.—I know that the chair speaks for the membership of this organization when he expresses to the President of the Chamber of Commerce and the representatives of the local and state medical societies of New Jersey our deepest appreciation of the hearty and sincere words of welcome extended to us, and our thanks for their efforts to make our stay here pleasant and profitable. (Applause.)

What is the next order of business, Mr. Secretary?

THE SECRETARY.—I have received quite a number of letters of regret from members who are not able to be present at this meeting. It would take considerable time to read all of them, and in my opinion the best thing that can be done under the circumstances is to accept them with our regrets.

The next order of business is the selection of the next place of meeting. It might be well for the members to consider this in the meantime. We have received invitations from Cleveland, Philadelphia, and St. Louis, but St. Louis is really entitled to the next meeting. The next city in order would be Cleveland, and after that Philadelphia. The place of meeting will be decided on at the executive session.

After announcements by Dr. William Edgar Darnall, Atlantic City, Chairman of the Local Committee of Arrangements, the reading of papers followed:

1. "Some interesting surgical conditions of the liver and biliary tract," by Dr. Joseph H. Branham, Baltimore, Maryland.

Discussed by Dr. Pfaff, and discussion closed by the essayist.

2. "Where the rubber glove is behind the times," by Dr. Robert T. Morris, New York City. This paper was discussed by Drs. Hayd, Bonifield, Hedges, Dickinson, Keefe, West and Rongy, after which the discussion was closed by the author of the paper.

3. "Hernia of the ileum through a rent in the mesentery," by Dr. William Edgar Darnall, Atlantic City, New Jersey, which was discussed by Drs. Peck, Bonifield, and in closing by the essayist.

4. "An unusual abdominal cyst; report of a case," by Dr. Orange G. Pfaff, Indianapolis, Indiana. (No discussion.)

5. "Obstruction of the superior mesenteric vessels from bands, with threatened gangrene of the greater part of the omentum," by Dr. James N. West, New York City.

This paper was discussed by Dr. Chandler, and in closing by the essayist.

6. "The toxic thyroid; its treatment by ether-oil-colonic anesthesia," by Dr. Gordon K. Dickinson, Jersey City, New Jersey.

Discussed by Dr. Crile.

7. "The Gehrung pessary," by Dr. Edward J. Ill, Newark, New Jersey.

This paper was discussed by Drs. Hayd, Rongy, Bonifield, Tovey, Sanes, and in closing by the essayist.

8. "Enuresis" by Dr. John W. Keefe, Providence, Rhode Island, which was discussed by Dr. Ill.

9. "Endocrine influence, mental and physical, in women," by Dr. James E. King, Buffalo, New York.

Discussed by Drs. Brown (William M.), West, Zinke, Crile, and in closing by the essayist.

On motion, the Association took a recess until 2 P. M.

Afternoon Session.—The Association reconvened at 2 P. M. and was called to order by the President.

10. "Case reports: (a) Encephalitis associated with pregnancy at term; (b) Malignant disease of cervix uteri in young primipara," by Dr. William M. Brown, Rochester, New York. (No discussion.)

11. "Pseudo-cholecystitis," by Dr. Harold D. Meeker, New York City.

This paper was discussed by Drs. Morris Dickinson, Bainbridge, Davis (James E.), and in closing by the essayist.

12. "Results obtained with the double-flap low cesarean section," by Dr. Thurston S. Welton, Brooklyn, New York, which was discussed by Drs. Quigley, Titus, McPherson, Zinke, Brown (William M.), Polak, and in closing by the essayist.

13. "My method of performing version," by Dr. Irving W. Potter, Buffalo, New York.

This paper was discussed by Drs. McPherson, Rongy, Hayd, Zinke, Dice, Harrar, and in closing by the essayist.

14. "The common pathological lesions which are classed as puerperal infection," by Dr. John Osborn Polak, Brooklyn, New York, which was discussed by Drs. Hayd, Davis (James E.). The discussion was closed by the essayist.

On motion, the Association took a recess until 7 P. M.

Evening Session.—The Association reconvened at 7 P. M. and was called to order by the President.

15. "Rupture of the bladder during labor; report of a case," by Dr. John W. Poucher, Poughkeepsie, New York.

Discussed by Dr. Tovey, and in closing by the essayist.

16. "Case reports: (a) Case of accidental hemorrhage; (b) Case of

hematuria in pregnancy," by Dr. James K. Quigley, Rochester, New York. (No discussion.)

17. "Splenic leukemia associated with pregnancy," by Dr. George W. Kosmak, New York City.

Discussed by Drs. Brown (William M.), Davis (James E.); the discussion was closed by the author of the paper.

18. "Missed abortion," by Dr. Jennings C. Litzenberg, Minneapolis, Minnesota, which was discussed by Drs. Schwarz, Rongy, Brown (G. Van Amber), and in closing by the essayist.

19. "Some cases of thrombophlebitis during the puerperium following an attack of influenza," by Dr. Lewis F. Smead, Toledo, Ohio.

This paper was discussed by Drs. Dickinson, Zinke, Crile, and in closing by the essayist.

20. "Dermoid cysts of the ovary; etiology, diagnosis and treatment," by Dr. Benjamin R. McClellan, Xenia, Ohio.

Discussed by Drs. Morris, Bandler, and in closing by the essayist.

On motion, the Association adjourned until Thursday morning, September 21, 9 A. M.

SECOND DAY—*September* 21, 1920

Morning Session.—The Association met at 9 A. M. and was called to order by the President.

21. "Treatment of abortion complicated by sepsis," by Dr. George A. Peck, New Rochelle, New York.

Discussed by Drs. West and Brown.

22. "A preliminary report of pyelitis in pregnancy with report of cases," by Dr. Greer Baughman, Richmond, Virginia.

Discussed by Drs. Polak, Furniss, Hayd, and discussion closed by the essayist.

23. "Benign mammary tumors and intestinal toxemia," by Dr. William Seaman Bainbridge, New York City.

Discussed by Drs. Davis (James E.), Furniss, Crile, and in closing by the essayist.

24. "Certain procedures in vaginal surgery, with lantern demonstration," by Dr. Samuel W. Bandler, New York City.

Discussed by Drs. Brown (G. Van Amber), Hayd, King, Welton, McGlinn (by invitation), Litzenberg, Potter, Hadden, and in closing by the essayist.

25. "Fibroid of the ovary," by Dr. Edmund D. Clark, Indianapolis, Indiana, which was discussed by Drs. Schwarz and Jones.

At this juncture, Dr. David Hadden, Vice-President, took the chair, and President George W. Crile, Cleveland, Ohio, delivered his address. He selected for his subject "Certain new conceptions of the relation of the liver to the problems of abdominal surgery."

On motion, the Association took a recess until 2 P. M.

Afternoon Session.—The Association reconvened at 2 P. M. and was called to order by the President.

26. "Some indications for hysterectomy," by Dr. James F. Baldwin, Columbus, Ohio. (No discussion.)

27. "Luteum extract; a further report," by Dr. Adam P. Leighton, Jr., Portland, Maine.

Discussed by Drs. Bandler, King, Baughman, Rongy, Sadlier, Hadden, Lorber (by invitation), and in closing by the essayist.

28. "Case of congenital absence of the vagina with other abnormalities," by Dr. David Hadden, Oakland, California.

Discussed by Drs. Baldwin and Crile.

29. "Preventive gynecology," by Dr. Henry S. Lott, Winston, North Carolina. (No discussion.)

30. "The female pelvic ureters," by Dr. David W. Tovey, New York City. (No discussion.)

31. "Pathological leucorrhea and its treatment," by Dr. Francis Reder, St. Louis, Missouri.

Discussed by Drs. Leighton, Welton, Tovey and Bainbridge, and the discussion closed by the essayist.

32. "Submucous adenomyomata," by Dr. Otto Schwarz, St. Louis, Missouri.

Discussed by Dr. Davis (James E.), and in closing by the essayist.

On motion, the Association adjourned until 9 A. M. Wednesday, September 22, 1920.

THIRD DAY—*Wednesday, September* 22, 1920

Morning Session.—The Association met at 9 A. M. and was called to order by the Vice-President, Dr. David Hadden.

33. "Borderline carcinoma of the cervix and its treatment," by Dr. Edward A. Weiss, Pittsburgh, Pennsylvania.

This paper was discussed by Drs. Branham, Brown (G. Van Amber), West, Rongy, Davis (James E.), Bainbridge, Bonifield, and the discussion was closed by the author of the paper.

34. "Report of a few cases of postoperative convalescence, complicated by faulty functioning of the ductless glands," by Dr. Charles L. Bonifield, Cincinnati, Ohio.

Discussed by Drs. Rongy, Darnall, Tovey, and in closing by the essayist.

35. "Case reports," by Dr. G. Van Amber Brown, Detroit, Michigan.

36. "Some factors that determine tissue resistance to cancer," by Dr. James E. Davis, Detroit, Michigan.

These two papers were discussed together by Drs. Schwarz, Bainbridge, and in closing by the essayist.

37. "Preparation of the skin for operation, with special reference to the use of picric acid," by Dr. Herbert W. Hewitt, Detroit, Michigan.

This paper was discussed by Drs. Bainbridge, Hadden, Schwarz, and in closing by Dr. Davis.

After the reading of the last scientific paper, Vice-President Hadden said: When I leave this meeting and start West, I feel that I am leaving behind men whose ideas and thoughts mean much to me and help me throughout the year; but there is also a feeling that I shall return next year to get stimulus and new ideas from contact with the members of this Association. And thus it is that feeling I have when I consider those members of our Association who have died during the year. I cannot feel that the energy we have stored here, or the power which we have is lost as soon as our bodies are dead. I feel we must go on. I think it is foolish for us to try to visualize in what form our power continues. We were just as incapable of visualizing the effects of the wireless or the x-ray before we had the means of recording them. I think we medical men, who know so much about the wonders of the human body, have really no basis for believing that the energy, the ideas, and the advice given us by those who have passed away are lost.

Being a younger member of the Association and living so far away, I have not known some of the men whose obituaries we are to listen to, as intimately as I should have liked to know them, but there is one man among the list who was a great inspiration to me, and that is Dr. Carstens, of Detroit. I feel that we have sustained a great loss in the death of that distinguished gentleman, and when the program reached me announcing his death, I felt it very keenly, because he was indeed to me a man of great inspiration.

I am going to ask Dr. Zinke to take the chair at this time, and Dr. Davis to occupy the Secretary's position, and bring to a close this very successful and interesting meeting. (Applause.)

Dr. Zinke took the chair and conducted the "In Memoriam" exercises.

Obituary notices were presented as follows:

Dr. John Young Brown, by Dr. Francis Reder, St. Louis, Missouri.

Dr. J. Henry Carstens, by Dr. John N. Bell, Detroit, Michigan. (The obituary of Dr. Carstens was read by Dr. G. Van Amber Brown in the absence of Dr. Bell.)

Dr. Thomas B. Eastmann, by Dr. Orange G. Pfaff, Indianapolis, Indiana.

Dr. Emery Marvel, by Dr. William Edgar Darnall, Atlantic City, New Jersey.

Dr. Xavier O. Werder, by Dr. Edward A. Weiss, Pittsburgh, Pennsylvania.

After the reading of the obituaries, Dr. Zinke said. Gentlemen: We have listened to five obituaries which constitute a diadem of five bright and sparkling jewels. These men have all done their duty well. They have died as men should die, quietly and without complaint.

DR. ZINKE (presiding).—The next order of business is the induction of officers elected.

It was moved and seconded that Dr. Otto Schwarz act as proxy for his father. Carried.

DR. SCHWARZ said: I appreciate very much this honor which you have conferred upon my father. He has been very active in the Association, and he has been particularly interested in my attending the meetings during the last few years. He was unable to come himself, and purely from an unselfish motive he has stayed away. I was much distressed to know that a president had never been elected except when he was attending the meeting, and I am highly pleased that this office was given to my father under these circumstances. (Applause.)

DR. ZINKE.—Dr. McClellan, who has been elected First Vice-President, will say a few words.

DR. MCCLELLAN.—Mr. Chairman, and Members of the Association: I am not a speechmaker, but just a plain, practical worker. I want, however, at this time to take the opportunity of saying what is really in the bottom of my heart. Association with real workers in this greatest profession in the world is no mean privilege, and I count it the highest joy of my life to come among a body of men who deal with the most essential problems that men ever have to solve for the welfare of humanity. Moreover, I consider no place more worthy than to be, year after year, in fellowship with the men of the spirits such as we have depicted in these admirable obituaries or eulogies. Those men are worthy of all that has been said about them— yea, they are men of whom not too much could be said. I count it, after all, the noblest thing in the world to be of service to our fellow-men, and I call your attention again to the words of the greatest physician of all, who said, "I am among you as he who serves." It is a privilege, therefore, to be with men like you, that love their fellow-men and are willing to give their best endeavors for their welfare. I thank you very much. (Applause.)

DR. ZINKE.—Unfortunately, the Second Vice-President is not present; and therefore, we cannot induct him into office.

Of the two members elected to the Executive Council, only one is present, Dr. A. B. Miller, from whom we shall expect a few remarks.

DR. MILLER.—I certainly thank the Association for the great honor conferred upon me in having re-elected me a member of the Executive Council. I have attended these meetings as a small boy, so to speak, when the Association was formed, and greater honor could not have been conferred upon me at that time than to have been invited to join a body of men forming the American Association of Obstetricians and Gynecologists. I appreciate now that the Association has lived through all these years until it has become one of the most powerful factors in solving some of the greatest problems that have confronted the medical

profession. We cannot place any other association above ours. We obstetricians are the men who have to deal with the beginning of life. I do not blame the Lord for having first made the earth and having done so made man, and after having made man, made his better half for the purpose of multiplying and replenishing the earth. Again, I wish to thank the Association for the distinguished honor conferred on me.

If I am in order, I should like to make a motion that the thanks of the Association be extended to the Local Committee of Arrangements for the preparations they have made for our reception; and further, that we extend a vote of thanks to the Ambassador Hotel for the accommodations given us and for favors we have received.

Seconded and unanimously carried.

DR. ZINKE.—In closing this meeting, permit me to say that my departure after every meeting is always filled with apprehension as to the success of the next meeting. I cannot rid myself of that feeling which increases as time passes until I have secured a sufficient number of promises of contributions for the next session, then I am at my ease for some time. It so happens, since I am secretary, that the latest meeting has always been the best, and I am glad to hear you say the same thing of this meeting. I bid you good-bye. (Applause.)

On motion, which was duly seconded and carried, the Association adjourned to meet in St. Louis, in September, 1921.

E. GUSTAV ZINKE, M.D., *Secretary.*

EXECUTIVE SESSION

Monday, September, 20, 1920.

The president, Dr. George W. Crile, in the Chair.

THE PRESIDENT.—The first order of business is voting on the candidates recommended by the Executive Council for election.

THE SECRETARY.—At the meeting of the Executive Council held last evening, the following candidates were recommended favorably to the Association for election: W. Wayne Babcock, Philadelphia; William H. Condit, Minneapolis, Minnesota; E. Lee Dorsett, St. Louis, Missouri; Fred M. Douglass, Toledo, Ohio; Robert E. Farr, Minneapolis, Minnesota; Arthur J. Mendenhall, Indianapolis, Indiana; Grandison D. Royston, St. Louis, Missouri; M. Pierce Rucker, Richmond, Virginia; Edward Speidel, Louisville, Kentucky; Paul Titus, Pittsburgh, Pennsylvania, and John Osborn Polak, Brooklyn, New York.

THE PRESIDENT.—What is your pleasure in regard to these candidates?

DR. DICKINSON.—I move the Secretary be instructed to cast a ballot for their election.

Seconded and carried.

The Secretary cast the ballot as instructed, and all of the candidates were declared duly elected.

THE SECRETARY.—I have here the resignation of Dr. Ralph Waldo, who writes that it is impossible for him to attend the meetings at this time of the year and he, therefore, hands in his resignation.

THE PRESIDENT.—What will you do with this communication?

DR. KEEFE.—I move the resignation be accepted with regret.

Seconded and carried.

THE PRESIDENT.—The next thing in order is the change in the name of our Association.

THE SECRETARY.—The resolution reads that the name of the Association be changed to the *American Association of Abdominal Surgeons, Obstetricians, and Gynecologists*, but the Executive Council at its meeting advised making an additional change, that the name should read "*American Association of Obstetricians, Gynecologists, and Abdominal Surgeons,*" with the proviso that abdominal surgery is to pertain to that which is associated with obstetrics and gynecology.

THE PRESIDENT.—You have heard the proposal of a change in the name of the Association. Are there any comments?

THE SECRETARY.—I move that the name be accepted, and that the change as suggested be made. Seconded.

DR. WEST.—I believe this change is a proper one, and is in accordance with the development of the time, but in regard to the proviso that it shall pertain entirely to such abdominal surgery as will lead up to gynecology, I do not see how it can carry any weight in changing the name. The name will indicate abdominal surgery, and the abdominal surgery of men is practically the same as that of women in most cases. There is very little deviation, so that it does not seem to me necessary to insert a proviso of that kind in taking action. I am heartily in favor of the change in name and exactly as the Executive Council has put it.

THE SECRETARY.—If we admit abdominal surgery, as it occurs in the male, we shall, to a great extent, cease to be obstetricians and gynecologists. Let the proviso be that of abdominal surgery pertaining to women.

The name of the new journal is the Journal of Obstetrics and Gynecology, and the journal will probably not accept anything that is foreign to diseases of women, or to obstetrics. I am apprehensive that we shall come in conflict with the policy of the journal. That was one of the troubles of the old "blue book"; too much material foreign to obstetrics and gynecology was admitted, and if we accept abdominal surgery as necessitated in the male, we shall have difficulty in getting the editor to publish certain of our papers in the new journal. In order to incorporate such papers in the transactions, we should have to pay extra for the printing and the paper for insertion into the transactions. I would insist that abdominal surgery be acceptable only as it pertains to women.

DR. KEEFE.—In introducing this resolution about a year ago, I conferred with a number of men in this Association, and it seemed from the fact that about one-third of our papers are on subjects pertaining to abdominal surgery, we were practically doing ourselves an injustice in saying that we are doing only obstetrics and gynecology. I realize that when the Association confined itself in the beginning practically to obstetrics and gynecology, it did a wonderful work, and there is no reason why the work on these subjects cannot be done in the future. But times have so changed that the abdominal surgery of thirty years ago is quite different from abdominal surgery today, and therefore some of us feel it would be desirable to have our title state exactly what we do. We do obstetrics, gynecology, and abdominal surgery. The fact that we do obstetrics and gynecology will not have a great tendency to bring in abdominal surgery in the male. We might have a tacit understanding that we will not bring in abdominal surgery in the male, although that might be a question for discussion. If we see fit, we might do that, but it seems to me that it would be wise for us to have our Association known as the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons.

DR. PFAFF.—As Dr. Keefe says, a great deal of our work is abdominal surgery, and a good share of abdominal surgery is done in the male; it would be a mistake for a man to be deprived of the privilege of presenting these cases here and be forced to seek another surgical association in which to present them, particularly if he does original research work. We should lose more than we should gain if we limited abdominal surgery entirely to the female.

THE PRESIDENT.—The easiest way to get at this matter is this: Shall we adopt this name with or without reservation?

DR. WEST.—I understand from Dr. Zinke's statement the difficulty that faces us, but I think that difficulty can be overcome in this way; instead of having the title or reservation indicate abdominal surgery which is peculiar to women, let us make it read abdominal surgery except that which is peculiar to men. That procedure would eliminate the difficulty which is the generative organs of men, prostatectomies, and such operations as that which are peculiar to men. A vast majority of abdominal operations that we do in men as well as in women are not peculiar to either sex. If we made that exception, I think it would cover the ground and give us a wealth of material which is peculiar to both sexes, and at the same time eliminate anything that pertains especially to men.

THE PRESIDENT.—Let us take a straw vote. The chair feels that he would like to see abdominal surgery included in respect to the remarks made by the last speaker, Dr. West. I think the interpretation Dr. West has made will be acceptable to every one here. I hope personally you will make it abdominal surgery. The members of this Association are in-

terested in much more than the female pelvic organs. Let us have a title that covers what we are doing.

The motion to change the name to the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons was put to a vote and unanimously carried.

THE PRESIDENT.—The next order of business is that the Executive Council has deemed it necessary to raise the annual dues to $25.00.

DR. DARNALL.—I move that the recommendation of the Council be approved.

Seconded and carried.

THE SECRETARY.—Dr. Dickinson has presented a resolution to the Executive Council, as follows: That at each meeting the President shall nominate an orator, who shall be prepared to deliver an oration on some historical or biographical topic; said topic to be selected by the essayist.

THE PRESIDENT.—What disposition do you wish to make of this resolution?

DR. DICKINSON.—I am very much interested in what the men of the past have done to build up our profession, and in the times during which they worked. It might be a little variation, therefore, from our present meetings, which are rather stiff, if somebody who is learned should deliver an oration on some biographical or historical topic, taking for instance, Semmelweis, and outlining difficulties and achievements or those of other men who have made medicine what it is today. That is the object of the resolution.

THE PRESIDENT.—May I ask for a motion on this proposal?

DR. MILLER.—I move the resolution be adopted. Seconded.

DR. WEST.—It seems to me, in the short time we are together here, that our time is fully taken up by our papers and discussions and by the business we transact in such an Association. Such orations are of a type about which a man would naturally inform himself during his leisure hours in his library. All of us, I take it, read up on the history of medicine, and it seems to me that the devotion of time in a meeting of this kind to such an oration would be inappropriate; that we need all of the three days to carry out the program and catch the trains to go back home.

DR. DICKINSON.—I do not want to push this matter at all.

THE PRESIDENT.—There is one suggestion that has occurred to the secretary and to me, that in the event of such a proposal's carrying, I should think it would be well to have the orator read a ten minute biographical synopsis and publish the full report.

The motion was voted on and declared lost.

THE SECRETARY.—The next proposition comes from one of our wisest members; it pertains to the office of the secretary. Dr. Hayd is a man of vision, a man who looks into the future, and he thought it wise, in order to provide for an exigency that might possibly occur, to have somebody prepared to take up the work of the secretary in the event that something should happen to him, which would compel him to discontinue his secretarial duties. Dr. Hayd will make a motion.

DR. HAYD.—For the last eight or ten years Dr. Zinke and I have been working very hard in the interests of the Association. I never saw Dr. Zinke looking better in my life, and he may live fifteen or twenty years more. However, the importance of the Association is uppermost, and as the work which devolves upon the secretary amounts to a great deal, I thought it was necessary that we should have some one trained for this important position. Therefore, at a meeting of the Executive Council, we agreed to recommend to you an Associate Secretary in the person of Dr. James E. Davis, Detroit. We feel that he will fill the position to our satisfaction.

THE PRESIDENT.—I have been associated with a great many different organizations in various capacities, but never have I known a Secretary who did his work in the magnificent way in which Dr. Zinke performs his duties, and I have learned to know that whatever this organization is, we owe it to Dr. Zinke. (Applause.)

DR. ZINKE.—While all this is very complimentary, and I appreciate it highly, I feel it my duty to say to you that a captain without good executive officers, a good ship, and a good crew amounts to nothing. Our president is the captain, I am the executive officer, you constitute the wonderful crew and the splendid ship is our Association. So you are the ship and the crew, and I have naught but praise for you. (Applause.)

DR. BONIFIELD.—I move that the recommendation of the Council be concurred in.

Seconded and carried.

THE PRESIDENT.—The next in order is the report of the Secretary.

The Secretary presented the following report.

Because of the fact that the Wm. Wood & Company discontinued the publication of the "Blue Book," "The American Journal of Obstetrics and Diseases of Women and Children," the Association was obliged to pay the entire expense connected with the publication of the last volume of transactions. Owing to the savings of previous years, our treasurer was able to meet the enormous expenditures of the past year and still retain a balance for the future. The itemized account of my financial report will show that I have received in dues from members and candidates, in receipts from sales of back volumes of transactions, and from libraries the sum-total of $3015.52. This amount was, at intervals during

the year, turned over to the treasurer, who reports that he has at present a balance in bank of $129.52, and a bond of $1000.00, or a total of $1129.52. It is but proper to state that the expenditures were carried out with the consent of the Executive Council, and I sincerely hope that our connection with the new *American Journal of Obstetrics and Gynecology* will enable us to produce the next volume at a very much reduced cost.

The report of the secretary and treasurer were referred to an auditing committee consisting of Drs. Edward J. Ill, A. B. Miller, and John W. Keefe.

Adjourned.

Tuesday, September 21, 1920.

The President, Dr. George W. Crile, in the Chair.

THE PRESIDENT.—The first order of business is a report by the Auditing Committee.

DR. EDWARD J. ILL.—Your Auditing Committee has gone very carefully over the books and accounts of the Secretary and Treasurer and find them correct in every particular.

It was moved and seconded that the report of the Auditing Committee be accepted. Carried.

THE PRESIDENT.—The next order is the election of officers, and the first officer to be elected is a President. Nominations for President are in order.

DR. ILL.—For a good many years we have had with us a man who has taken a very active part in our proceedings, but unfortunately he is absent from this meeting. Nevertheless he has sent his son to represent him. I take great pleasure in nominating Dr. Henry Schwarz, St. Louis, Missouri, as our next President. (Applause.)

DR. REDER.—I take great pleasure in seconding the nomination.

DR. KOSMAK.—I move that nominations be closed.

Seconded and carried.

DR. BONIFIELD.—I move that the rules be suspended and the Secretary be instructed to cast the ballot of the Association for Dr. Henry Schwarz.

Seconded and carried.

The Secretary cast the ballot as instructed, and Dr. Schwarz was declared duly elected.

THE PRESIDENT.—The next office is that of First Vice-President. Nominations are in order.

DR. BONIFIELD.—The great State of Ohio is always furnishing Presidents, and we feel Dr. Schwarz will be an excellent President, but we need a good man for First Vice-President, and I therefore nominate Dr. Ben R. McClellan, Xenia, Ohio.

DR. HAYD.—I second the nomination.

It was moved that nominations be closed. Seconded and carried.

DR. HAYD.—I move that the rules be suspended and the Secretary be instructed to cast the ballot for Dr. McClellan.

Seconded and carried.

The Secretary cast the ballot as instructed, and Dr. McClellan was declared duly elected.

THE PRESIDENT.—Nominations for Second Vice-President are in order.

DR. A. B. MILLER.—Owing to what has been said regarding the incoming President and the necessity for having a second vice-president who is capable of carrying on the work of the Association, in case anything should happen, I would nominate for Second Vice-President, Dr. James E. King.

DR. KEEFE.—I second the nomination of Dr. King.

DR. BONIFIELD.—I move that nominations be closed, and that the Secretary be instructed to cast the ballot for Dr. King.

Seconded and carried.

The Secretary cast the ballot as instructed and Dr. King was declared duly elected.

THE PRESIDENT.—The next office to be elected is a Secretary. It will be difficult for us to fill this office, and the chair takes great pleasure in merely conforming to what the Association has done in these many years by renominating and continuing in office our great friend, organizer, creator, and maintainer of the Association, Dr. E. Gustav Zinke, as Secretary. (Applause.)

In response to cries of speech! speech! Dr. Zinke said: What really fills my heart most at this moment is the token of appreciation on your part of my services. I am free to confess I love the work that brings me in contact with every member of the Association as in no other way it could possibly do, and I have learned to love you all. (Applause.)

THE PRESIDENT.—The next office to be filled is that of Treasurer.

DR. KOSMAK.—I nominate Dr. Herman E. Hayd to succeed himself as Treasurer.

DR. BONIFIELD.—I move that the rules be suspended and that the Secretary be instructed to cast the ballot for Dr. Hayd.

Seconded and carried.

The Secretary cast the ballot as instructed and Dr. Hayd was declared duly elected Treasurer.

THE SECRETARY.—You have elected an Assistant Secretary, Dr. James E. Davis, Detroit, and I am glad to say that the selection has fallen upon a gentleman who is eminently fitted for the position. I feel absolutely certain he will fill the position to your satisfaction.

In response to cries of speech! speech! Dr. Davis said: This is a newly created office, and I can hardly say I fall under the rules of it. However, I thank the Association for this election, and I am quite sure it will be an honor and a pleasure to work with a superior like Dr. Zinke.

THE PRESIDENT.—We have to elect two men to the Executive Council. The terms of Dr. A. B. Miller and Dr. John W. Keefe expire.

THE SECRETARY.—It is the custom of the society for the retiring President to fill one of these vacancies; and the other vacancy is to be filled by nomination from the floor.

THE PRESIDENT.—Will you please put in nomination two names for positions on the Executive Council.

DR. BONIFIELD.—I nominate the retiring President, Dr. George W. Crile.

Seconded and carried.

DR. KEEFE.—I nominate Dr. A. B. Miller, to succeed himself, who is one of the founders of the Association.

Seconded by Dr. Hayd and carried.

DR. BONIFIELD.—I move that the rules be suspended and the Secretary be instructed to cast the ballot of these two gentlemen.

Seconded and carried.

The Secretary cast the ballot in favor of these two gentlemen, and they were declared duly elected.

THE PRESIDENT.—The selection of the next place of meeting is now in order.

THE SECRETARY.—We have received invitations from St. Louis, Cleveland, and Toledo.

DR. KOSMAK.—I move that the choice of place of meeting be left to the decision of the Executive Council. Seconded.

THE SECRETARY.—It is difficult to ascertain the wishes of the Executive Council. It necessitates a good deal of correspondence, and then it is not always satisfactory to all the Fellows. I would rather that we here in executive session determine the place of the next meeting.

DR. KOSMAK.—In view of what Dr. Zinke has said, I withdrawn my motion.

DR. BONIFIELD.—I move that we accept the invitation to meet in St. Louis in 1921.

Seconded and carried.

THE PRESIDENT.—The Chamber of Commerce of Cleveland through its organizations and entertainment committee has forwarded letters inviting the Association to meet in Cleveland. I think it is entirely appropriate that the Association should go to St. Louis next year because Dr. Schwarz has been elected President.

DR. BONIFIELD.—I wish to introduce the following resolution:

RESOLVED, That the Secretary of this Association be instructed in arranging the program for future meetings not to arrange for any session during the evening.

THE SECRETARY.—I rise to object to that motion with all the might within me. How should we have been able to finish our program if we did not have a meeting in the evening of the first day? The Association is so strong, so vigorous, and so full of life that the amount of work it has to do can hardly be disposed of in six sessions. We have to have seven sessions. I know it is a strenuous task to sit through three sessions in one day, but I am bearing up under it, and I do not see why you should not be able to do so. We all profit by it. Last night's session was a magnificent one. There were excellent papers and good discussions, and I do not believe we should abandon holding one evening session. To do so would reduce the size of our annual volume. Last year's volume is a work to be proud of, and I rather think it is a mistake not to have one evening session. I appreciate Dr. Bonifield's motive very much, but we do not come here for pleasure. Let us take pleasure in the work we are doing; and, after this is done, we may relax and have a good time for a day or two if we so desire. I would rather that you let things stand as heretofore.

DR. BONIFIELD.—This question might be referred to the Executive Council for action.

DR. HAYD.—It is hard to sit through three sessions in one day, but there is something that the rest of the members of the Association are proud of, and that is our transactions. You cannot publish a commendable volume of transactions unless we get good papers and discussions. Moreover, you cannot expect to hold members of the Association unless you give them an opportunity to read their papers and have them discussed. I think Dr. Zinke is right.

DR. WEST.—I think the control should be left to the Executive Council and be easily arranged without having an evening session. An evening session is a strain after a morning and afternoon session. While, of course, we put in three days of good hard work, and we expect to stand by the Association throughout all its sessions, yet I think it is too exhausting to have a session in the evening. It takes away a good deal of the freshness from the last day and interferes with a certain amount of diversion which we all look forward to in a meeting of this kind. It seems to me, on the whole it would be better to avoid evening sessions, an arrangement can be made by limiting the time allowed to the number of papers we have without cutting down the number of papers.

DR. MILLER.—It would seem wise for us to act as a body rather than as an Executive Council. However, I believe the Executive Council would decide on eliminating the evening meetings.

The resolution of Dr. Bonifield was put to a vote and carried.

As there was no further business to come before the executive session, on motion, which was duly seconded and carried, the executive session then adjourned *sine die*.

E. GUSTAV ZINKE, M.D., *Secretary*.

PAPERS

READ AT THE

THIRTY-THIRD ANNUAL MEETING

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS, GYNECOLOGISTS

AND

ABDOMINAL SURGEONS

HELD AT THE

AMBASSADOR HOTEL

ATLANTIC CITY, NEW JERSEY

SEPTEMBER 20, 21, AND 22, 1920

ADDRESS OF THE PRESIDENT

CERTAIN NEW CONCEPTIONS OF THE RELATION OF THE LIVER TO THE PROBLEMS OF ABDOMINAL SURGERY

A Summary of Recent Investigations and of Methods Based upon Them Whereby the Mortality of Abdominal Operations May Be Diminished

By George W. Crile, M.D., F.A.C.S., Cleveland, Ohio

WHAT may be termed the "problems of abdominal surgery" are no longer concerned with such simple operations as the removal of an interval appendix, or of an acute appendix in advance of peritonitis, the removal of benign tumors, of stones in the bladder, or of uncomplicated gallstones. Operative technic in these operations is practically standardized and the patients come to operation with their normal factors of safety little if at all impaired.

Our problems lie rather among the so-called "bad risk" cases, patients in whom the margin of safety has been reduced by starvation, by infection, by the toxins of cancer, by autointoxication from obstruction of the bowels, from acute and chronic suppurating gall bladder or from acute and chronic peritonitis. To these may be added such extraabdominal conditions as interstitial nephritis with high blood-pressure, old age, cardiorenal disease, pulmonary tuberculosis, etc.

It is for such cases as these that we are seeking added means of control whereby to supplement our surgical resources. New consideration of these problems need not be concerned with problems of technic, with methods of suture or of approach, with anatomic considerations, with increased skill of manipulation, with the control of hemorrhage, with suture materials; these methods of attack have been mastered by the great abdominal surgeons of the past and the present generations.

Clinical and physiologic studies have yielded certain valuable data, such as the futility of stimulants and the advantages of blood transfusion, but they failed to discover the fundamental nature of the phenomena presented by these cases. We, therefore, endeavored to solve the problem by histologic studies in which we were continually confronted by the constant co-existence of the clinical phenomena of lowered vitality from any cause with certain histologic changes in the brain, liver, and adrenals. The microscope could not reveal the nature of these changes; but since the histologic picture represented variations in the molecular concentration of the cell contents and changes in the nuclear and cell membranes, it occurred to us, especially in view of the studies

of Osterhaut, Galeotti, Lillie, Loeb, and other physicists, that these cell changes might be more accurately studied and some light thrown upon the interrelation of the organs in which they occurred, by measurements of their electric conductivity.

To this end, the electric conductivities of 4,798 sections of tissues from 436 rabbits and 137 clinical specimens have been measured. After establishing the apparent range of conductivity of these tissues, especially the brain and the liver, in normal animals, under changing conditions, including varying lengths of confinement, different seasons, etc., groups of rabbits were subjected to exhaustion from various causes: prolonged insomnia, extreme fright, physical trauma, surgical shock, infection,

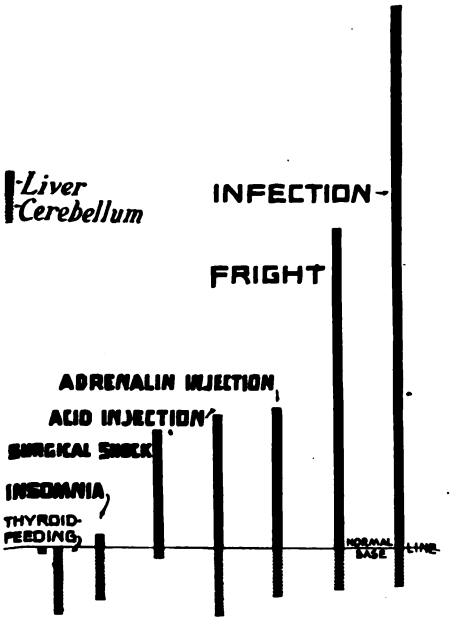

Fig. 1.—Percentile variations in the electric conductivity of the liver and cerebellum in exhaustion from various causes. (Note that the conductivity of the liver is increased, whereas the conductivity of the brain is decreased.)

hydrochloric acid injection, thyroid feeding, iodoform poisoning, strychnine poisoning, prolonged ether anesthesia, and prolonged nitrous oxid anesthesia. We have observed also the effect upon the electric conductivity of the brain and the liver of the inceptive stage of surgical shock, of toxic shock, of strychnine and of adrenalin shock. We have observed the effects of sleep and of rest after prolonged insomnia and of morphine in the presence of infection. We have measured the conductivity of the brain and of the liver in rabbit fetuses, in newborn, and in young rabbits. These results are to be reported in detail elsewhere. The outstanding fact is that exhaustion from any cause, surgical shock, insomnia, emotion, fright, infection, etc., is marked by a *diminished conductivity of the*

brain and an increased conductivity of the liver (Fig. 1). With the exception of the liver, the tendency of all the tissues in exhaustion is toward a diminished conductivity. Restoration, when it is accomplished by long periods of rest after insomnia, is marked by an increasing conductivity of the cerebrum and cerebellum toward the normal and decreasing conductivity of the liver toward the normal.

In brief, the findings in our researches which bear directly upon the relation of the liver to the functional activity of the brain may be summarized as follows:

(a) After excision of the liver, the power of the brain to drive the organism to transform potential energy into kinetic energy, such as heat or muscular or mental action, is rapidly diminished and completely lost at the time of inevitable death, usually within a few hours.

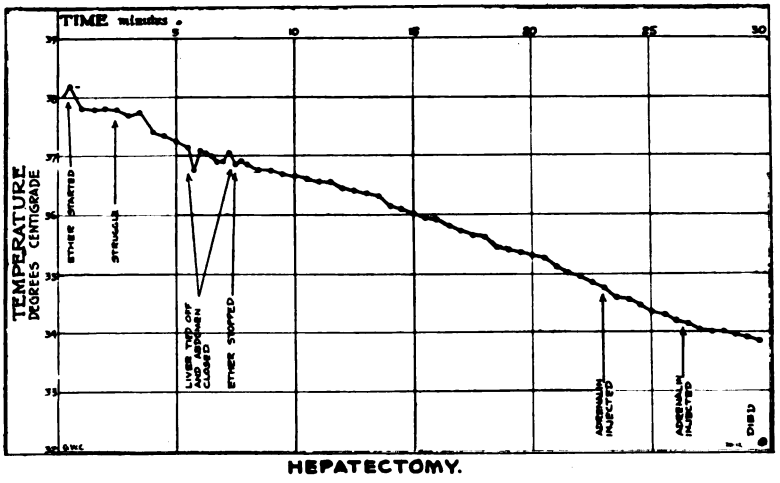

Fig. 2.—Temperature changes in the brain after excision of the liver.

(b) After excision of the liver, the temperature of the brain falls progressively until death (Fig. 2).

(c) The brain-cells show changes in the cytologic structure which are progressive from the moment the liver is excised (Fig. 3).

(d) In every type of exhaustion from whatever cause, the cells of the liver show cytologic changes, such as diminished power of differential staining, edema, and increased electric conductivity (Fig. 4).

(e) Granting adequate circulation and respiration in a decapitated animal, the excision of the liver causes death earlier than decapitation or adrenalectomy.

From these findings we may suppose that the integrity of the liver is essential to the work of the brain, just as the integrity of the liver is essential to the elimination of the acid by-products of metabolism by the kidneys and the lungs. When the liver is excised, the blood tends to be-

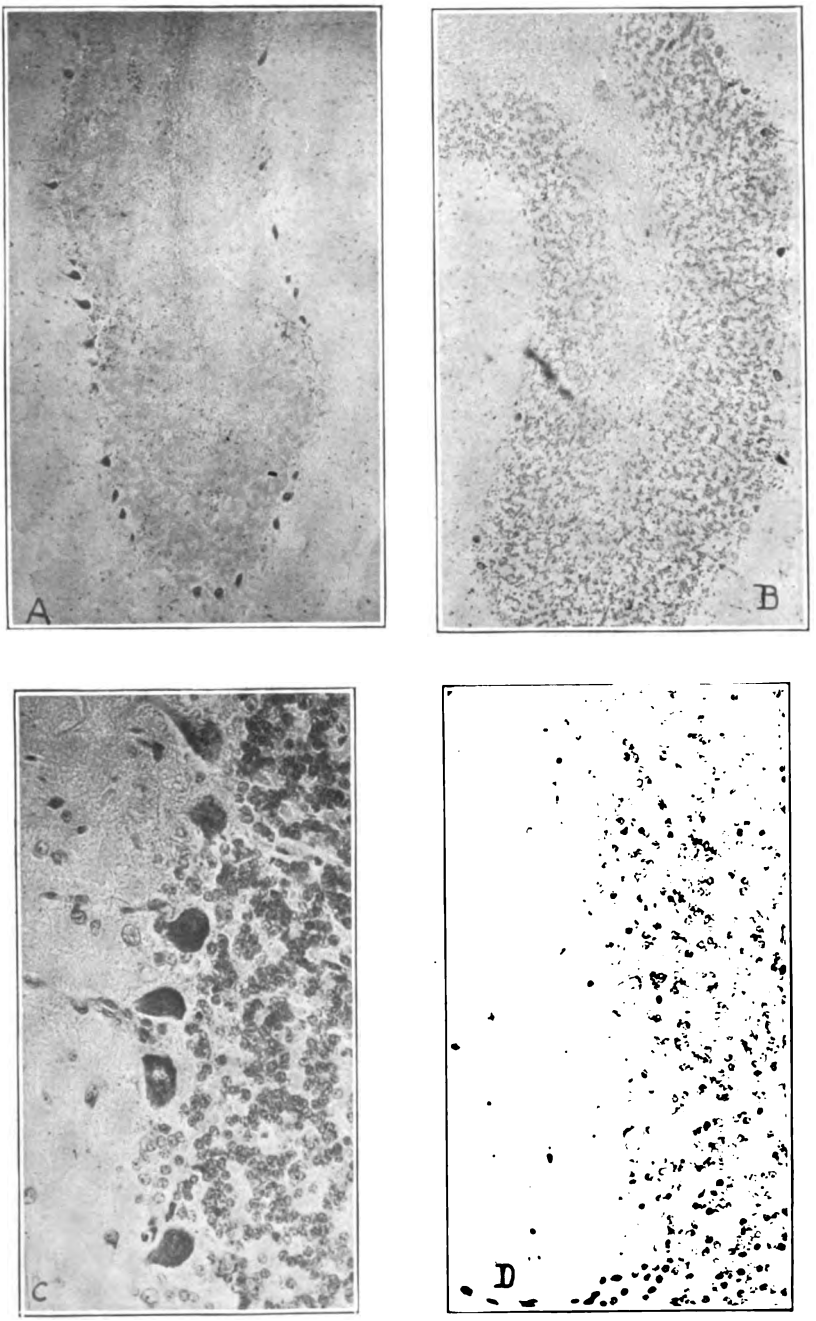

Fig. 3.—Cytologic changes in the brain cells after excision of the liver. *A* and *C*, section of normal cerebellum of a dog. *B* and *D*, section of cerebellum of a dog whose liver had been excised. (*A* and *B* from photomicrographs x85. *C* and *D* from photomicrographs x310.)

come acid as the animal approaches exhaustion. Neither the transfusion of blood nor the administration of adrenalin or of morphine exerts the least check on the exhaustion and death which follow excision of the liver.

For its oxidizing and reducing power, the liver apparently depends, in part at least, on the adrenals; for the excessive intravenous injection of adrenalin on the one hand, and adrenalectomy on the other, cause marked cytologic changes in the liver cells—chromatolysis, edema, eccentric position of the nucleus.

As noted above, in our electric conductivity studies we found that in exhaustion from any cause the liver and the brain were affected in opposite directions, i.e., in extreme exhaustion the conductivity of the brain was decreased and the conductivity of the liver was increased. In the earliest stages of stimulation these changes were reversed, the period of increased conductivity of the brain apparently corresponding to the period of hyperchromatism established by our histologic studies.

From these premises we conclude that the liver is inseparably associated with the brain in the production of shock and exhaustion; but as the liver has no means of immediate contact with the external excitants of shock and exhaustion, it apparently in some way is influenced indirectly through the mediation of the brain.

If our premises regarding the interrelation of the brain and the liver are sound; i.e., if the liver is the key to the chemical stabilization of the brain cells, it follows that when the margin of safety has been reduced by diseases of the liver, such as sclerosis, an abscess, a tumor, infection, or jaundice, by starvation or emaciation, by want of water equilibrium, by loss of sleep, or worry, or fatigue from exertion, etc., then the liver must be protected against an increased burden of work such as worry, dread, muscular exertion, the trauma of operation, or pain during or after operation. These factors are excitants of metabolism; excitants of metabolism increase the work of the liver; increased work of the liver must be avoided.

Our studies, moreover, indicate that the excitants of metabolism are not the only cause of increased strain upon the liver and the nervous system. Activity of the liver cells is interfered with also by whatever interferes with the internal respiration; e.g., a failing circulation of the blood from impaired heart action, myocardial weakness, or valvular lesions. Any heart deficiency which lessens the circulation of the blood in the liver and therefore diminishes the internal respiration of the liver cells, is best met by the early administration of digitalis in approximately the following dosage: 20 minims every four hours for twelve doses. If the patient has not improved sufficiently after two days, this dosage is repeated.

Another common interference with the internal respiration of the liver is impairment of the pulmonary exchange, as in asthma, in emphysema,

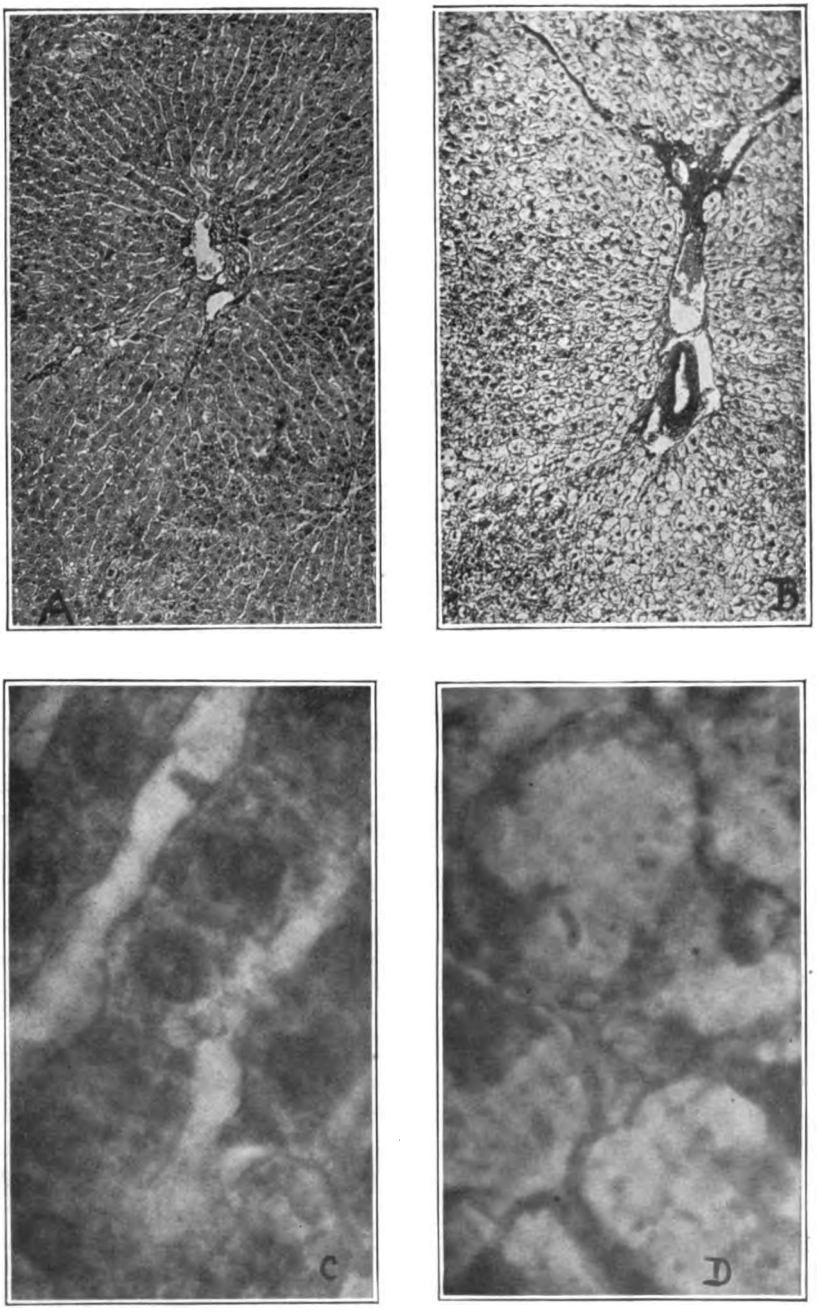

Fig 4.—Cytologic changes in the liver cells in exhaustion. *A* and *C*, section of normal liver of a rabbit. *B* and *D*, section of the liver of a rabbit exhausted by continuous insomnia for one hundred hours. In *B* and *D* note vacuolated spaces and general disappearance of the cytoplasm, and in *D* the eccentric misshapen nuclei. (*A* and *B* from photomicrographs x100. *C* and *D* from photomicrographs x1640.)

in pleurisy with effusion, in pulmonary tuberculosis; in the presence of a lung abscess or an empyema tumor in the mediastinum, in internal and external obstructions of the trachea, in short, fat, stodgy, stertorous alcoholics, whose breathing is normally a wheeze, and who are normally in a state of suboxidation. A patient in whom any one of these conditions is present must be treated with the utmost care in order to protect the internal respiration of the liver; as must, also, patients whose internal respiration is diminished by primary or secondary anemia. Such patients endure with difficulty increased metabolism from any cause, or any further interference with their internal respiration.

In the course of operations the most important single cause of interference with the internal respiration is the inhalation anesthetic. Dr. Menton and I showed that all inhalation anesthetics cause an increased H-ion concentration of the blood; that is to say, an increased acidity. Increased acidity interferes directly with the internal respiration. Moreover, in the case of ether anesthesia, there is also an enormous decrease in the permeability of the cell membranes, so that the internal respiration is entirely cut off. Temperature measurements with the thermocouple showed an astonishing fall in the temperature of the brain under ether anesthesia, as rapid a fall as that which followed the excision of the liver (Fig. 5-*A*). It is a fact of extraordinary interest that either excision of the liver or complete surgical anesthesia by ether causes death in about an equal length of time; and that if the blood pressure and respiration be maintained, animals live longer after decapitation than under ether anesthesia, or after excision of the liver. In its physiologic results, therefore, full ether anesthesia is the equivalent of the removal of the liver.

On the other hand, nitrous oxid-oxygen anesthesia presents a totally different picture (Fig. 5-*B*). The temperature of the brain scarcely changes; and the internal respiration is only slightly disturbed. Nevertheless, in heavily handicapped patients, even full nitrous oxid anesthesia is not wholly safe. The safe method in such cases as we have listed above is nitrous oxid analgesia, combined with complete local anesthesia. In addition, the loss of temperature of the liver by the cooling of the blood which passes to the liver from the exposed intestines should be prevented as far as possible. The evil effects of cooling the liver and the good effects of warming the liver are obvious, but are strikingly illustrated by our temperature measurements, in which it was significant to note that the introduction of hot water into the stomach was followed by an immediate increase in the temperature of both the brain and the liver, *the increase in the brain occurring first* (Fig. 6).

Up to this point we have dealt with experimental results, with the everyday observations of the clinic, and with certain theoretic deductions. But the practical value of an experimental research, or the applicability of a theory is to be found only by its test in the crucible

of the clinic. In accordance with these principles, therefore, we have adopted the following general scheme for the management of abdominal operations:

1. The control of fear and anxiety, if not by management, then by a moderate dose of morphine.
2. The use of nitrous oxid-oxygen anesthesia.
3. Regional blocking by local anesthesia.
4. A feather-edge technic.
5. Keeping raw tissue covered as much as possible.
6. Prevention of loss of blood.
7. Prevention of loss of body heat.

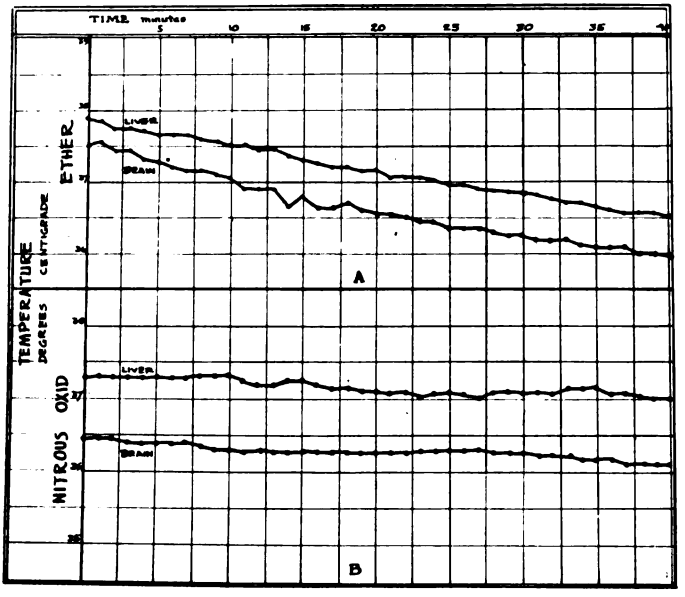

Fig. 5.—Comparative changes in the temperature of the brain and the liver produced (*A*) by ether anesthesia, (*B*) by nitrous oxid-oxygen anesthesia.

8. In addition to the inhalation anesthetic, local infiltration is also employed, to promote relaxation of the abdominal muscles. If relaxation is not complete, ether is added, but is discontinued as soon as the requisite degree of relaxation is secured.

9. As we have emphasized, nitrous oxid-oxygen is the anesthetic of choice. In the absence of a specially trained anesthetist, however, ether may be required, in which case Gwathmey's warmed vapor method with local infiltration is the method of choice, so that the least possible amount of ether will be used.

10. If there is free blood, as in military surgery, Major Taylor's plan of leaving the blood in the abdomen until the intestinal technic is completed seems sound. Apparently, the free blood serves as a measurable protection against damage from the exposure to air.

11. A shock patient is turned from side to side as little as possible during operation, as has been emphasized by Major Gregory Marshall.

12. The abdomen is kept open the least possible length of time.

13. Manipulations and exposure of the viscera are reduced to a minimum; therefore, an ample incision is made.

14. If a patient is in deep shock, some blood is transfused at the beginning and more at the close of the operation.

15. In certain cases, if debility is marked, and the operation is such as to interfere with the physiologic balance of the patient, as in resections of the stomach, intestines, or gall bladder, it is advisable to perform the operation in two seances, the second major step being taken after the nutritional balance is well established.

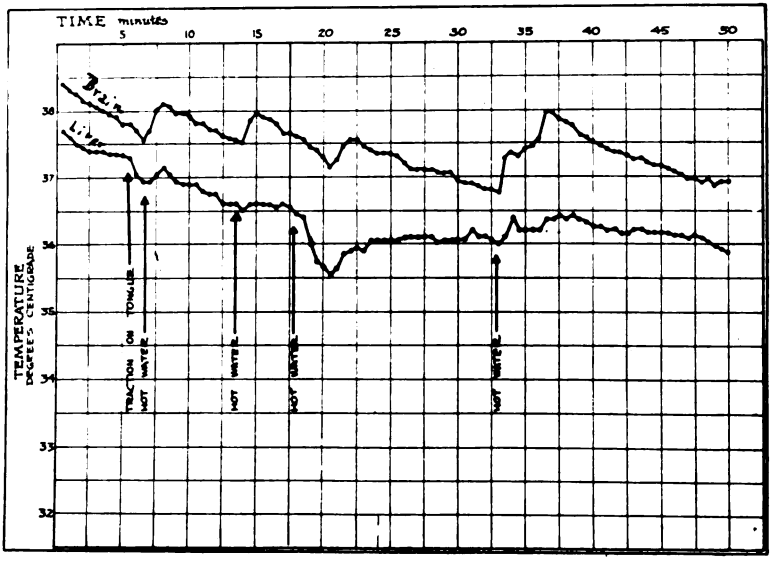

Fig. 6.—Changes in the temperature of the brain and the liver produced by the introduction of hot water into the stomach.

16. In starved cases from cancer, or in grave risks, nitrous oxid is used only to provide analgesia, and anesthesia is secured mainly by local anesthesia.

17. If, as we believe, the liver is the key to chemical stabilization, and since chemical activity is increased by heat, then heat applied to the entire abdomen both before and after operation in bad risk cases increases the temperature of the liver, thus increasing its metabolism. This increased metabolism of the liver, in turn, defends the organism as a whole. Thus far the clinical experience seems to bear out this assumption.

By the observance of this general plan of management, always adapted to the requirements of the individual patient, the mortality rate for bad risk patients has been markedly lessened and the range of operability extended, as is shown in particular by a comparative study of the case

COMPARATIVE MORTALITY TABLE

	PRIOR TO APPLICATION OF PHYSICAL INTERPRETATION			SINCE APPLICATION OF PHYSICAL INTERPRETATION		
	NUMBER OF CASES	DEATHS	RATE	NUMBER OF CASES	DEATHS	RATE
Gall bladder and common duct operations	389	34	6.2%	62.1	1	1.6%
Gastroenterostomy and resection of the stomach for cancer and ulcer	110	17	15.5%	43	1	2.3%
Colostomies and Radical operations for cancer of rectum	30	3	10%	44	0	0%

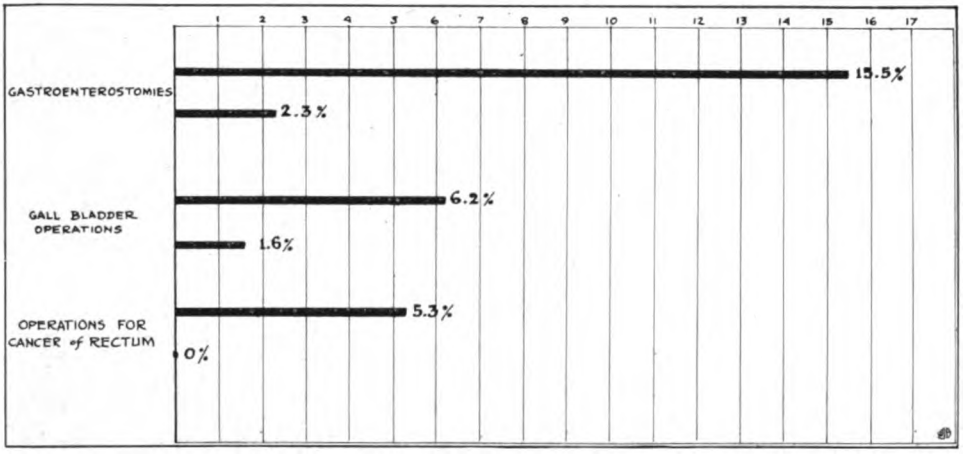

Fig. 7.—Comparison of mortality of bad risk cases before and since the application of the physical interpretation.

histories of my personal series of bad risk cases, including 153 gastroenterostomies and gastric resections, 451 gall bladder operations and 74 operations for cancer of the rectum, in which comparison is made between the series prior to the application of the principles stated above and the series since the practical application of these principles (Fig. 7).

SOME INTERESTING SURGICAL CONDITIONS OF THE LIVER AND BILIARY TRACT

By Joseph H. Branham, M.D., Baltimore, Md.

THE gall bladder is ordinarily the seat of surgical conditions in this region because of the inherent susceptibility of this organ, due to anatomic peculiarities. The underlying feature of the surgical condition is usually some form of infection which may be induced, first, through the blood stream, or by direct extension along the common and cystic ducts; second, cholelithiasis, which, however, is nearly always secondary to infection. Traumatism and tumors are comparatively rare. Gallstones are nearly always formed in the bladder, but may also form in the ducts.

What shall be done with a diseased gall bladder? In my papers read before this Society in 1913 and 1917, I predicted that cholecystectomy would become the operation of choice. This prediction has come true. When an operation is necessary, the organ is already diseased. The value of a normal gall bladder is not very great; its influence on the digestive process is slight and uncertain. As a reservoir it has some value and after its removal there is a compensatory dilatation of the common and hepatic ducts. Animals which have no gall bladder have large, distensible ducts to take its place. A healthy gall bladder should never be removed, nor should it be subjected to operation. When symptoms are severe enough to demand operation the organ in most cases is so diseased as to be of little or no value, and is a menace to future health.

The question of reoperation in gall bladder disease is ably discussed by Dr. John W. Deaver in the *Journal of the American Medical Association* of April 17, 1920. He reports reoperation in 10 per cent of cholecystostomies and 1.3 per cent of cholecystectomies. The reports from the Mayo Clinics are similar. A few years ago, cholecystostomy showed less mortality. This is now reversed because the operation is now done in extreme cases of severe infection of the gall bladder with complications. The reoperations are necessitated by recurrence of stones, by adhesions, and by fistulæ. The first are much more common after cholecystostomy, but may occur in the ducts after cholecystectomy. Adhesions of such a character as to require reoperation, because of pain or interference with the mobility of the stomach or intestines, result, in most instances, in severe cases which are associated with suppurative peritonitis and which require long continued drainage. In such cases the adhesions are caused by the primary condition and not by the opera-

tion. I do not believe that, in a given case of gallstones or cholecystitis, adhesions should be more frequent or severe after removal than after drainage, provided the removal is done carefully.

For several years I have operated by a method that is practically subperitoneal. I have not seen this method described, but do not doubt that others may have used it. It is briefly as follows:

After the abdomen is opened the ducts and neighboring organs are carefully examined; this can usually be done by palpation. If the disease is confined to the gall bladder, an oval incision is made over the lower anterior surface of the organ; the peritoneal coat is dissected from the deeper tissues; when the duct is reached it can always be recognized by the well-marked sphincter. A considerable margin of the peritoneal coat is left at the liver attachment; the duct is severed and, after being explored and emptied of stones, etc., a large catheter is fastened to it with a twenty-day catgut suture. The peritoneal coat from each side is stitched together and then to the ventral peritoneum. This leaves the catheter outside the peritoneal cavity and gives a smooth serous surface to cover the entire wound, thus preventing adhesions. By confining the incision to the accessible part of the organ, the suturing is made easier. A small cigarette drain left in for one or two days is all that is needed in most cases. Operations performed in this way are rarely followed by adhesions and the patients are usually left in good condition.

Fistulæ opening from the gall bladder or ducts into the small intestine or colon, and in one case (reported in this paper) into the stomach, are often the cause of secondary operation. When the adhesions are very dense and extensive, gastroenterostomy gives the best permanent relief. Failure to close the drainage tract which in most cases, like the above, is due to obstruction by stones or stricture, may necessitate reoperation.

CASE 1.—Mrs. K.; aged forty-nine; white; came under my care in the early part of the winter of 1908. She had marked ptosis of the liver and a large tumor connected with its lower anterior surface. This was thought to be malignant. Operation, December 18, 1908. On opening the abdomen a tumor half as large as a man's fist was found. It was in the lower abdomen and dragged the liver, to which it was attached, down to such a degree that an elastic tube could be placed above it entirely cutting off the blood supply and making the removal bloodless. The liver wound was snugly closed by mattress sutures. The patient made a quick recovery. Microscopic report showed gumma. Similar cases occurred in the practice of two prominent surgeons in Baltimore about the same time. Routine Wassermann examination will, probably, prevent such mistakes.

CASE 2.—E. C., aged fifty-six; white; entered Franklin Square Hospital during the summer of 1914 with a history of recurrent attacks of pain in the gall bladder region associated with jaundice. Operation: cholecystostomy. At that time the gall bladder was very much damaged and I thought it should have been removed, but this was not done because of the patient's depressed condition. Patient was relieved for a time from the symptoms and remained in fair health. Later, gall bladder trouble appeared. Several of these attacks were very severe and associated

with high fever. Suffering became so acute that the patient re-entered the hospital May 13, 1919. Operation at this time revealed a very much thickened gall bladder, filled with stones and closely adhering to the stomach. The gall bladder was removed and, in separating it from the stomach, a fistulous opening was found between the two organs. The patient was relieved temporarily, but soon had a return of the pain and was operated a third time, December 20, 1919, when several very large stones, packed in sand-like material, were removed from the common duct. Several other stones were discharged during period of drainage. The fistula has healed, and the patient's general condition is improved. Before the second operation the patient suffered from frequent and severe attacks of biliary vomiting. Dr. Deaver refers to the occurrence of such cases in his paper.

CASE 3.—Mrs. K.; aged nineteen; white. Operated, June 21, 1920, for suppurative salpingitis; vaginal puncture and drainage; condition followed confinement and ran a subacute course. Adhesions very dense and relief only temporary. On July 31, the abdomen was opened and the left tube removed. Ten days later this was followed by an enterostomy for obstruction. At this time the patient was *in extremis*, but she soon rallied and gained strength very rapidly.

August 14, 1920, this patient was suffering with classical symptoms of acute gall bladder abscess, jaundice and toxemia very marked. Cholecystostomy. Gall bladder very tense; anterior part filled with turbid fluid; posterior part with thick pus; anterior lining membrane pale, the posterior one, near duct, markedly congested; a small stone was discovered in the duct near the gall bladder. The improvement was immediate and the patient is now at home and in good condition. Drainage of the bladder seemed best in this case because of the low vitality of the patient and because the organ was little changed.

DISCUSSION

DR. ORANGE G. PFAFF, INDIANAPOLIS, INDIANA.—It would be well to emphasize one point in connection with this paper, namely, that we must aim to be conservative in the treatment of gall bladder diseases. In the last few years the statement has been frequently made that a gall bladder once diseased is always diseased, but that is not always so. If we open the abdomen on account of symptoms and find no stones, and find comparatively little pathology that is demonstrable, and if the gall bladder is not easily emptied by compression I believe that gall bladder ought to be drained.

DR. BRANHAM (closing).—I wrote this paper largely to put on record a case of fistula between the gall bladder and the stomach. The only other mention of this condition I can find in literature is by Dr. Deaver, as quoted in this paper.

WHERE THE RUBBER GLOVE IS BEHIND THE TIMES

By Robert T. Morris, M.D., F.A.C.S., New York, N. Y.

WHEN men smile and agree, progress weeps. At the present moment many men, who would like to express themselves freely on the subject of the rubber glove, are afraid to do so because of complications which might arise in connection with hospital politics and because of social reactions relating to a convention or established habit in thought. As civilization becomes more and more complex there is a tendency toward standardizations. Standardization represents a natural reaction to radicalism, a necessary reaction to radicalism which, like the rush of antibodies to a point of irritation, may sometimes result in autolysis and destructive end result. The rubber glove belongs to standardization and is one of its most valuable adjuncts. The standardization idea in every field of human activity represents a great moving force of recognized value. It reaches limitations. A locomotive represents a great moving force. It reaches limitations at the end of a track at a station. If it keeps right on past its limitations it may smash the station. Standardization reaches limitations when it smothers individuality. Some of the labor unions furnish an object lesson. Picture Darwin standardized to fit the thought of the Established Church of England of his day.

Surgeons, being human, cannot escape human movements and behavior. Whenever we have a high degree of civilization a great deal of painstaking attention is required before men can reach the common level in any sort of professional work. What does this mean in our profession? It means that by the time when all doctors are pretty well agreed upon the desirability of any one resource they are often behind the times. The very best men get behind the times for the reason that their good qualities, recognized by so large a part of the community, have brought them so much occupation that it has been impossible for them to follow new leaders of thought. They are prone to depend upon tradition. Tradition is the greatest of guides for minds of the mean type and the meanest of guides for minds of the great type. Neurology and psychiatry were beginning to make progress along the lines of objective teaching of Virchow when along came the blight of Freudian mysticism throwing many psychiatrists back to the days of Schelling and Hahnemann in the middle of the last century. Surgeons were getting fairly under way with the principles of the fourth era of surgery when along came the rubber glove acting as a blight upon a rapidly growing subject. Almost all fads have a basis in good fact. The rubber glove had a large basis in good fact, representing one of the most important advances in sur-

gery. It reached limitations, ran off the track, and exerted destructive influence upon the fourth era of surgery in its relation to abdominal work. It is in this particular field that the rubber glove is behind the times.

What is the fourth era of surgery? The first era was heroic. Then came the anatomic era. Following the anatomic era, Pasteur and Lister introduced the third or pathologic era. That was the one in which the surgeon disregarding Nature's resources, attempted to remove bacteria and their products by means of his own resources. He conscientiously acted like the faithful ape that tried to destroy the fly upon his sleeping master's forehead, using a big stone for the purpose. Wright and Metchnikoff then gave us materials which allowed us to construct the basis for a fourth or physiologic era of surgery. That era into which we are just now emerging gives the patient Home Rule. The patient is turned over to himself with the least possible degree of injury to his natural protective resources. He is allowed to manufacture phagocytes and opsonins freely and this he does when there has been the least degree of shock to throw the belt from the wheels of his endocrine machinery.

With the introduction of the rubber glove came the longer incision in abdominal surgery. We could see incisions grow in length as rubber gloves became more and more widely adopted. Abdominal surgeons lost their cunning because the sense of touch was interfered with to such an extent that it became necessary for them to do much of their work by the sense of sight, a sense that is recognized as standing second rate to the tactile sense in certain matters of precision. Before the days of rubber gloves there were surgeons, to be sure, who used long incisions and who worked by sight in abdominal surgery, but these were not the ones who had the best results. In that day surgeons, like Lawson Tait and Joseph Price, who worked through small incisions rapidly were the ones who had the best results; Tait, in particular, not only disregarded rules of asepsis and antisepsis but openly railed at them. We could not understand the meaning of the good results of Price and Tait at a time when the colleges were teaching the principles of asepsis and antisepsis. Today we know. The principles of the fourth era of surgery were empirically brought into play by surgeons who worked rapidly through small incisions.

In order to determine the degree to which rubber gloves actually interfered with the tactile sense, I had tests made by an expert upon several physicians and surgeons. The tests all showed a lowering of the tactile sense, even on the part of very expert surgeons and, curiously enough, the physician who stood highest in the tests was not a surgeon but a specialist in the diseases of children.

Dr. T. L. Bennett, the anesthetist, has stated that according to his observation the best surgeon is the one who acts all the while as though he were afraid of waking the patient. Long incisions and thorough ex-

amination of viscera wake the patient. Deeper anesthesia becomes necessary. In natural sequence perhaps to the long incision and working by sight came the later development of thorough examination and exploration of the abdomen with the surgeon's hand introduced through the incision. This in turn had a tendency to lessen the cunning of the diagnostician. It is the forte of the diagnostician to make accurate conclusions in regard to the sites of disturbing factors in advance of operation. When this has been done one or two small incisions frequently allow work to be done more gently and rapidly and more directly to the purpose than is possible through a long comprehensive incision.

No method in surgery is static. We change from one method to another. We have done this in the past and will continue to do so for thousands of years to come. It is my belief that the long incision which belongs to the rubber glove is not static. Surgeons will awaken again to the principles of the fourth era of surgery which, like objective psychiatry, has received a temporary set back.

Does the rubber glove lessen the number of bacteria that are actually carried into an abdominal wound? We may answer that question by way of an object lesson offered by the exposure of culture media in Petri plates in the operating room. The larger the Petri plate the more complete the infection of its contents. The longer the exposure of the Petri plate the more complete the infection of its contents. This infection comes from where? From bacteria falling from the air into the culture medium. More bacteria fall into a large abdominal incision from the air than are carried in by well prepared hands wearing no rubber gloves. We must remember that most of the bacteria which fall into a wound from the air or which are carried in by the hands are destroyed or at least rendered latent by the enzymes of the wound. In addition to the shock caused by the long incision and by thorough examination of viscera, danger from emboli and from postoperative adhesions is greater in degree proportionately to the length of the incision and the length of time expended in operating.

Dr. J. W. Kennedy of Philadelphia, states that in a review of one thousand re-operations of the abdomen in his own experience ninety-nine per cent showed adhesions to the scar or in the immediate neighborhood of the scar in patients who had been operated upon previously by men who wore rubber gloves. He states that in his own work only seven per cent of re-operations showed any signs of adhesion to the scar or in its vicinity. Some of the ninety-nine per cent of incision line adhesions were doubtless due to the employment of irritating antiseptics for skin preparation of the abdomen. Iodine, for example, valuable as it is, if not removed with alcohol in advance of operation will do to endothelium what it does to epithelium. This fact does not lessen the force of the idea that the longer an incision the more injury to endothelium.

Rubber gloves have incidentally been a factor in making this a day

of instruments in the abdominal cavity. We are prone to forget that the peritoneum with its lymph system is better equipped than is the skin for resisting infection. The extent to which the peritoneum will ward off or control infection is remarkable provided that it is not shocked by a blow below the belt. The peritoneum may even wall in material which escapes from a perforated appendix or pylorus or typhoid bowel. Many a surgeon knows this fact but he keeps it walled in. He might have a chill if the fact were suddenly to break through into his thought cavity.

In cases of appendicitis with abscess the plan of making a short incision and of running when pus ran reduced the death rate to such an extent that Dr. L. W. Hotchkiss of New York had a series of seventy-six appendicitis operations without a death at a hospital in which the previous death rate in the same class of cases had been thirty-one per cent. In pyosalpinx cases, when working through a short incision after the first acute stages of infection have been brought under control, one may shell out the damaged tubes, split them and fasten them to the anterior abdominal wall and allow the pus to pour out of that exit until the patient responds to vaccine treatment. Six months afterward the abdomen may be reopened, adhesions separated, and the tubes or remains of tubes dropped back into the pelvis, and the patient may then have children. It is true that some of the pregnancies will be extrauterine but the patient, warned of that, is not in great danger because we easily care for an extrauterine pregnancy in its early stages. On the other hand there will be more happy mothers with good babies borne than we find to be possible when a surgeon wearing rubber gloves and working through a long incision commits devastating surgery in the pelvis.

In cases of acute typhoid bowel perforation or gastric ulcer perforation, a two minute operation by a surgeon wearing no gloves will give better service than a thirty-minute operation on the part of a surgeon wearing gloves and working by sight.

Do not mistake the intention of this paper. It does not stand in opposition to the idea of the rubber glove which, in my opinion, represents one of the best advances of the surgery of the day. Personally I use the rubber glove, observing the latest decrees, in practically all of my surgery, with the exception of the peritoneal cavity and when dealing with malignant disease. The rubber glove is behind the times when it comes into conflict with the principles of the fourth era of surgery in abdominal work. If conscientious surgeons are behind the times today in their employment of rubber gloves in abdominal work it is not their fault, it is the fault of a public which fails to endow our educational institutions in such a way as to teach young surgeons among other things the difference between the peritoneal cavity and the synovial cavity of the knee joint in regard to their respective responses to injury, mechanical or bacterial.

DISCUSSION

DR. HERMAN E. HAYD, BUFFALO, NEW YORK.—We all agree with Dr. Morris that long incisions are perhaps in most cases unnecessary, and particularly when the object is to investigate a lot of possible pathology which the ordinary diagnostician ought to have made out before he operated. He did us a good service when he taught us to do our surgery through small incisions and to develop our faculty of tactile sense; but I was rather surprised that such a judicial operator should have put before this Association so strongly the results of the work of Kennedy who is one of the representatives of the well-known Joseph Price. However, when he tells us that 99 per cent of the cases that other men operated on who wore gloves had adhesions, as quoted by Dr. Morris, and he and others only had 7 per cent adhesions without the use of gloves, I consider the statement ridiculous. Out of 100 cases there were at least some 60 to 75 per cent that were the simplest kind of operations which could only have taken a short time to perform and would have achieved the best results that Dr. Morris expects from the physiologic era of surgery. There is no need because we wear gloves to produce traumatism from handling the tissues and there is no necessity except in the rarest cases in exploring the abdominal cavity to find possible foci of irritation or pathologic lesions. I do not believe Kennedy's deductions and I do not believe it is possible that adhesions could take place in the hands of 99 men from the use of rubber gloves, and Kennedy's patients only have 7 per cent adhesions.

DR. CHARLES L. BONIFIELD, CINCINNATI, OHIO.—I approve of the first three sentences in which Dr. Morris tells us that if we were to standardize the medical profession we would immediately stop progress. A few years ago the Carnegie Foundation sent out a report with the endeavor to induce us all to teach medicine exactly alike, and as a consequence various colleges all over the country were turning out medical graduates as much alike as peas from the same pod. Now, the American College of Surgeons is trying to have us make our histories exactly alike. It would be no more ridiculous to make each one of us read papers alike before this Association. Every one of us agrees that we should have complete histories, but to make me follow out exactly the method of others is a foolish thing. We want to provide for individuality.

When it comes to the rubber glove proposition, I, like Dr. Hayd, cannot believe the rubber glove in and of itself causes adhesions. I can conceive of a man with rubber gloves being rough, and a man without rubber gloves scratching tissues with his finger nails. One of the things that induced me at an early date to use rubber gloves was the fact that my finger nails were very hard to keep clean. I seldom knew whether I had them clean or not, and I felt it was better to cover them up with something that I could boil. That the rubber glove does obstruct tactile sense a little nobody denies. For the purpose of making a minute and accurate diagnosis, I do not want to use a glove in making a vaginal examination. If a man does not often get his hands in pus, he can keep them fairly clean and sterilize them sufficiently to get along, but the average man will do more aseptic surgery if he uses rubber gloves.

DR. JOHN W. KEEFE, PROVIDENCE, R. I.—There is no question that a man with rubber gloves on cannot feel as readily as though he did not wear them. When rubber gloves first came into use I employed them in almost all the cases I had, but now and then I met with difficulties, so I took the gloves off as I thought I could feel better without them. I told Dr. McBurney about my difficulty and he said that this attitude was a mistaken one. The gloves should be kept on in a difficult case and your fingers educated as to how differently things feel with the gloves on. I have practiced that ever since.

It seems to me when you have educated your fingers to the feel of tissues with the glove on, there is very little difference between that impression and one without the glove. Of course it takes some time to educate the sense of touch with a glove on. Undoubtedly the rubber glove has done more to save lives than any other thing among surgical appliances.

DR. ABRAHAM J. RONGY, NEW YORK CITY.—I believe that rubber gloves protect us from infection. This was vividly impressed upon my mind in the case of one of my former chiefs who received a primary chancre of the right hand while attending an obstetrical patient.

In a city like New York, not only is it unsafe to operate without gloves, but it is unsafe to examine patients in the office without them. As a measure of protection, gloves are one of the best things for the physician to use.

DR. MORRIS (closing the discussion).—In regard to the remarks of Dr. Hayd, I took Dr. Kennedy at his word. He referred to adhesions to the abdominal line of incision, and not to other adhesions.

Dr. Bonifield brought up the question of standardization. We have to bear in mind what would have happened if Darwin and Galileo had been standardized according to the thought of their day.

Dr. Hedges asked why we need to use longer incisions with gloves. Simply because the tactile sense is diminished, and we have to bring into employment another sense. Instead of using one sense we use two, and the second one is poorer in quality than the first.

In regard to Dr. Rongy's remarks, I brought out the point that it is only in peritoneal surgery that the surgeon is behind the times if he employs rubber gloves in his work. As a general statement, the use of rubber gloves is one of the most distinct advances ever made in surgery. They belong to standardization and I employ them religiously except in this one field, where neater and safer work is done without them.

HERNIA OF THE ILEUM THROUGH A RENT IN THE MESENTERY

By Wm. Edgar Darnall, M.D., F.A.C.S., Atlantic City, N. J.

THE occurrence of the hernia described below is very unusual. I can recall but one case reported in medical literature similar to this one. The author's name I have forgotten. F. A. Roscher, Christiana, Norway, however, reported a case of "Reposition *en bloc* with Ileus," in 1919, in which there was a condition somewhat akin to that in my patient.

Mrs. D. Age, forty-six, married, weight 200 lbs., one child. She has never been seriously ill; family history negative. She was the picture of health. Has had no symptoms until recently when she noticed a "lump" in the abdomen and suffered from menorrhagia.

Examination revealed a fibroid tumor of considerable size, freely movable and uncomplicated; there was also a very slight laceration of the cervix. On July 12, 1918, I performed a supravaginal hysterectomy. From this operation she made a most perfect recovery.

On August 12th, a month afterwards, she ate a large dinner. About six o'clock the next morning she was seized with vomiting and a most agonizing pain in the epigastrium. The pain was so severe that morphine had to be administered. Irrigation of the bowel produced a copious stool. The next day her pains were considerably improved but distention appeared. During the afternoon there was an absence of peristaltic sounds on auscultation, the pulse was increased in rapidity, and the temperature had risen to 101° F. Dr. Hobart A. Hare, of Philadelphia, saw the patient with me in consultation and was of the opinion that, in spite of the temperature, there was some form of obstruction, although enemata still brought away some feces and gas. Operation was decided upon and performed at 5 P. M. The findings were as follows: Through an opening in the mesentery of the second convolution of the ileum there had slipped a loop of the ileum belonging to the first convolution high up on the left side under the spleen. There was a volvulus of this loop, and it was gangrenous and perforated. There was an abscess in the left kidney pouch and foci of pus at various locations in the upper abdomen. The whole abdominal cavity was filled with fluid and intestinal contents.

The hernia was released and the rent in the mesentery closed. Twelve inches of ileum were resected and a Murphy button used for anastomosis. Drainage and counterdrainage were used. Proctoclysis with Locke-Ringer solution was instituted and the Fowler position ordered.

An opportunity was afforded of inspecting the lower abdomen and pelvis which were found in perfect condition with no adhesions or constricting bands anywhere. Indeed it was rather exceptional to find everything so smooth and free from adhesions just one month after the first operation.

I am unable to account for the rent in the mesentery so far from the site of the pelvic operation, which made this unusual hernia possible. The patient had led a very quiet and well-ordered life since her first operation and was apparently in perfect health. Death occurred from shock about five hours after the operation.

DISCUSSION

DR. GEORGE A. PECK, NEW ROCHELLE, NEW YORK.—May I ask the writer whether he did an anastomosis with the Murphy button at the time of operation?

DR. DARNALL.—There were two operations, one of which was an anastomosis made by the Murphy button, and the other an operation for hernia.

DR. PECK.—My point is whether resection of the intestine should be done during obstruction. If an enterostomy can be done at that time and drainage secured, it is a much shorter operation, and patients often will recover from enterostomy, which is a short operation, where they would not recover from a long operation as in doing an end-to-end or any other form of suturing or uniting the bowel after resection.

I want to make the point whether we should not, when we possibly can, in obstruction of the bowel, do enterostomy, and not a resection of the bowel.

DR. CHARLES L. BONIFIELD, CINCINNATI, OHIO.—I want to make a remark on the point the last speaker brought out, namely, whether we should resort to enterostomy or to anastomosis in case of obstruction of the bowel. In my opinion that depends more on how long the obstruction has existed than on the immediate condition of the patient. It has been pretty well demonstrated that when there is partial or complete obstruction of the small intestine, the contents of the bowel above the seat of obstruction become poisonous, and that if we release the contents into the healthy bowel below, our patient will often suffer collapse and die from poisoning in a few hours as if we had not operated, while if the intestine be drained, the patient will get well.

DR. ROBERT T. MORRIS, NEW YORK CITY.—I would like to emphasize the point brought out by Dr. Bonifield, as I think it is the crux of the whole situation.

DR. DARNALL (closing the discussion).—The contents of the intestine had already drained out and were free in the abdominal cavity. There was no obstruction from above.

As to whether we should make an enterostomy and do drainage or not, or whether we should do anastomosis, I think, as Dr. Bonifield says, it is largely a question of the condition of the patient and where the obstruction is. In the fistulas of the upper bowel we all have had the experience that if we allow them to continue to drain, the patient becomes dehydrated, is soon exhausted and dies; whereas if the fistula is around the lower ileum or in the colon, we do not have that trouble, the fistula has a tendency to close spontaneously and the patient recovers. So, it seems to me, a point of good judgment that we do not drain the upper part of the bowel too much.

AN UNUSUAL ABDOMINAL CYST

By O. G. Pfaff, M.D., Indianapolis, Ind.

THIS case is reported on account of its rarity and the puzzling diagnostic elements which it presents; consequently attention is directed almost solely to certain mechanical features which are here briefly described.

On March 20, 1920, I was consulted by a young married woman on account of a large abdominal cyst which had been tapped ten days previously; twelve quarts of thin fluid having been drawn off at that time, according to the statements of the patient and her husband. Her history had been one of good health. The first menstruation occurred at the age of fourteen and this function had always been normal. She had passed through three normal pregnancies, the last of which occurred three years ago, and was followed by phlebitis affecting both legs. This had, however, practically disappeared when I first saw her.

She noticed some abdominal swelling about four months before she came to me. This had not given her very much trouble until about six weeks before she consulted me, when she began to suffer severely from pressure symptoms. Her appetite was impaired and she had lost a few pounds in weight.

The abdomen was greatly distended, and fluctuation was readily elicited in every part. Dullness on percussion was general with the exception of a slight indistinct resonance in the epigastrium.

The case was considered one of large ovarian cyst. She came into the hospital, March 22, and I operated the following day.

Through the usual median incision I came directly upon the sac, which was so densely adherent to the parietal peritoneum that it required some care to develop a line of cleavage; the further separation, however, being accomplished with only moderate difficulty and I was then able to pass my hand freely in every direction, widely on either side and almost from the diaphragm to the pelvic brim. Retracting the lower angle of the abdominal incision the bladder came into view; it was normal in appearance and free from adhesions. Its wholesome color contrasted strongly with the dark, purplish red hue of the cyst wall, which was firmly adherent across the brim of the pelvis in front of the uterus and on a line corresponding to the vesicouterine fold. Upon separating the sac along this line a gush of several quarts of water occurred. I continued the separation and lifted up a flap of the material seemingly constituting the anterior wall of the cyst, but which was now recognized as a perverted and greatly thickened omentum. With the lower omental flap held up, I came upon a number of peritoneal cysts varying in size from that of a walnut to a large grape fruit. The whole pelvis was filled with this mass. The intestines were held down and away from the anterior abdominal wall by innumerable strands of adhesions so that, even when distended by gas, there would be no note of tympany elicited on percussion. This was one of the puzzling elements in diagnosis. The laboratory report on the specimen removed for examination stated that the condition was a proliferating tuberculosis with much newly formed fibrous tissue.

Merry describes certain rare forms of tuberculous peritonitis which manifest themselves as large tumors which, on account of their abnormal situation, present very confusing features leading to a variety of diagnostic errors. He reports a number of cases. Numerous cases are also recorded of tuberculous cysts which present clinical pictures and physical resemblances to pyosalpinx.

The only report which I have been able to find of a case somewhat similar to

the one I have related was by A. J. Nyulasy in the Australasian Gazette. The patient was a healthy looking girl of seventeen years, with a greatly enlarged abdomen and long standing pain in the iliac fossa. Examination showed dullness extending upwards towards the umbilicus in the midline and to the right of it; but higher on the left side, the dull area being rather indefinitely fluctuant. When the abdomen was opened, the omentum was found adherent to the abdominal wall, greatly thickened and caused the anterior wall to resemble a fluctuating cyst. Along with the thickened peritoneum was a layer of fibrinous material which largely formed the front and sides of the cyst wall and spreading below completely hid from view the uterus and appendages. Posteriorly the cyst wall was formed by the intestines.

The case which I report is unique in my experience. The great thickening of the omentum, the extensive fibrinous formation, the restrained viscera, all were unusual; and the resultant absence of tympany regardless of posture constituted a complex which was very puzzling, indeed, and very misleading in diagnosis.

OBSTRUCTION OF THE SUPERIOR MESENTERIC VESSELS FROM BANDS WITH THREATENED GANGRENE OF THE GREATER PART OF THE SMALL INTESTINE. RECOVERY

By James N. West, M.D., New York, N. Y.

THE writer has been unable to find any record of a similar case, although the occurrence of gangrene of a part of the intestine from localized thrombosis of the vasa intestini tenuis has been reported; also cases of gangrene of the small intestine with death, as result of thrombosis of the superior mesenteric vessels. It is possible that some of the cases of gangrene of the intestine from thrombosis of the mesenteric vessels may have been due to a cause similar to that which obstructed the vessels in this instance and, therefore, if operated upon with sufficient promptness, life might have been saved.

The case was as follows: Miss I. G., age twenty, admitted to the Post Graduate hospital at 9 A. M., May 2nd, 1918. Chief symptoms: severe general pain in the abdomen with vomiting. Duration, three days. Family history negative. Heart and lungs negative. Abdomen tender and moderately distended. Blood examination: leucocytes, 15800; polynuclears, 82; lymphocytes, 18. The pain in the abdomen became unbearable and notwithstanding the administration of 1/6 grain of morphine half an hour before, the girl was screaming with the distress. She was lying on the side and no coherent answers to questions could be obtained. She was forcibly turned upon her back in order to examine her abdomen. It was tender and moderately distended. On deep pressure a long mass about the size of the wrist could be felt posteriorly to the left of the spinal column. Vaginal examination was unsatisfactory. At this time the pulse was 120, temperature 101.5° F., respiration 24.

At 5:30 the patient was taken to the operating room and a long median incision made. The picture first presented was that of the whole of the small intestine far advanced toward gangrene. Lifting the intestines out of the abdomen, it was seen that a firm band passed from right to left at a point a little above the level of the umbilicus, being attached well over to the left side. It was immediately seen that this band was firmly constricting the superior mesenteric vessels. Below the constriction the mesentery was swollen and showed in its cellular tissues extravasated blood similar to that seen in a twisted pedicle of an ovarian cyst.

The band was the mesentery of a cecum which had revolved toward the left carrying the appendix vermiformis with it. The appendix had become inflamed and attached there. Thus as a result of a hyperdescended cecum with volvulus and an appendicitis occurring on the left side of the abdomen, the mesenteric vessels had undergone a gradual constriction which, probably, became complete about 4 P. M., and which was relieved by operation at 5:30.

Operation.—The adhesions of cecum and appendix were freed, the appendix removed, and the cecum revolved into its proper position and fixed there. Almost immediately upon freeing the mesocecum from over the mesenteric vessels a faint glow of red began to show in the intestines, and before the abdomen was closed this had assumed a deep dark red hue.

In the course of the operation it was observed that there was a double pyosalpinx, the tubes being in a somewhat nodular condition and about the size of the index

finger. No attempt was made to remove them as the patient's condition was bad. The abdomen was closed without drainage.

She seemed to rally well after the operation, but at 8 A. M. the next morning the temperature was 100.6° F., pulse 144, respiration 28, and she was vomiting. At 10 A.M., the pulse was 160. She was then infused with 800 c.c. normal saline solution with adrenalin chloride solution. The pulse came down to 140, then to 124 in a few hours. Other stimulation was used from time to time. Flatus and some dark brown slightly bloody feces were passed. She had also vomited repeatedly blood-stained mucous fluid.

On the third day the pulse again went up to 160 and the patient's condition was bad. At this time the abdomen was much distended. She was given stimulants and a milk and molasses enema. This brought away much flatus. On the fourth day vomiting ceased, she retained liquid nourishment, slept some, and her general appearance was better.

From the third day to the fifteenth her temperature ranged daily from 99° to 103°, the curve of the temperature chart resembling that of mild septicemia. From the twentieth day until the day of her discharge the temperature did not go above 101°, but did not really assume the normal type until the thirty-fifth day. On the fourth day a diarrhea set in which became very severe and was only partially controlled by opiates and bismuth.

On the twelfth day an examination of the blood for typhoid, paratyphoid and syphilis was made. All tests were negative. At this time a blood count showed: leucocytes, 36500; polynuclear, total, 94; lymphocytes, total, 6. The urine was negative. The wound healed by first intention. From the twentieth day on the bowels became practically normal, the diarrhea having lasted sixteen days.

Patient was discharged cured on the thirty-ninth day after entering the hospital. She has been seen recently and is well and hearty. The pyosalpinx is causing her no symptoms and her digestive system functionates perfectly. The writer attributes the collapse at the beginning, the diarrhea, the leucocytosis and the septic temperature to autolysis (cell destruction) incident to the threatened gangrene of nearly the whole small intestinal tract.

The superior mesenteric artery supplies the whole length of the small intestine, except the first part of the duodenum. It also supplies the cecum, ascending and transverse colon. It is a vessel of large size arising from the fore part of the aorta about one quarter of an inch below the celiac axis, being covered at this region by the splenic vein and pancreas. Thus the destruction of this vessel or obliteration would result in gangrene of the greater part of the small intestine.

Malpositions of the cecum are of frequent occurrence. In the development of the intestine this is, as it were, the last part which becomes fixed. The abnormal situation, or mobility of the cecum, naturally lends itself to the occurrence of appendicitis in abnormal situations. Therefore, in cases presenting the symptom-complex of appendicitis minus the normal situation, one should bear in mind the possibility of appendicitis in an abnormal situation.

Abnormal situations of the cecum have been found more frequently in children than in adults and are usually labelled as hyperdescent, where the cecum is abnormally low and hypodescent where it is abnormally high in its position. Hyperdescent lends itself to volvulus, which has in itself at times demanded operation on account of obstruction.

R. H. Fowler has made a comprehensive study of this subject, but confines his observations chiefly to abbreviated colon and the high situation of the cecum, and makes no mention of movable cecum and appendiceal complications depending upon this mobility.

The chief lesson to be learned from this case is that when, on opening the abdomen, one finds a small intestine in a state approximating gangrene, he should not close it without a careful search for the cause. The search in this case revealed a condition which, relieved, resulted in saving the life of the patient. It also shows the necessity of prompt operation in abdominal conditions presenting sudden and violent symptoms.

The following references, except Gray, contain reports of similar cases.

REFERENCES

Gray's Anatomy, p. 577.
Fowler, R. H.: Developmental Anomalies of Position of Large Intestine, Med. Rec., New York, Feb. 26, 1916, lxxxix, 353.
Arch. Ped., September, 1916, xxxiii, 665.
Harvey, S. C.: Congenital Variations in Peritoneal Relation of Ascending Colon, Cecum, Appendix, and Terminal Ileum, Ann. Surg., June, lxvii, 641.
Davis, B. B.: Thrombosis and Embolism of Mesenteric Vessels, Nebraska Med. Jour., November, iii, 345.
Fischer, Hermann: Thrombosis and Embolism of the Mesenteric Vessels, Arch. Diagnosis, October, 1909.
Shoemaker, George Erity: A Report of a Case of Resection Following Thrombosis of Mesentery, New York Med. Jour., July, 1919.
Roeder, C. A.: The Movable Cecum, New York Med. Jour., 1909.
Robinson, B.: St. Louis Cour. Med., 1902, xxviii, 241-353-426.
Corner and Sargent: Ann. Surg., 1905, xli, 63-75.

DISCUSSION

DR. JOSEPH H. BRANHAM, BALTIMORE, MARYLAND.—I would like to ask Dr. West whether there was any intestine caught under this adhesive band or only the blood vessels?

DR. WEST.—Only the blood vessels. The cecum had swung across to the left side of the abdomen, and this was a hyperdescended cecum, so that it had a mesentery, and this mesentery formed a regular arch from the mesenteric vessels, and at the time I got in they were completely obstructed, not the intestine.

DR. GEORGE F. CHANDLER, KINGSTON, NEW YORK.—Recently I had a case very similar to the one reported in which there was a band which extended from the iliopectineal line across to the mesentery of the ileum about six or eight inches from the ileocecal valve. The intestines had become twisted, and there was an area of about twenty inches or more of intestine which was practically gangrenous. The woman was in an extreme condition. The only thing I did was to free the band and make three punctures of the intestines, drain out the contents as best I could, and sew them up. There was fluid in the abdomen, I put in a tube, and trusted to the opium treatment, and I am happy to say that the woman is well.

It was a similar case due to the obstruction of the circulation in the intestine, and without resection she has made a recovery.

It is rather interesting to note that I had previously operated on this woman three times, once for an extrauterine pregnancy, once for a gangrenous appendix, and once for carcinoma of the breast.

DR. WEST (closing the discussion).—The reason I reported this case was that when we opened the abdomen and viewed the intestine, apparently all the small intestine was gangrenous, and I was advised by the house surgeon who was always ready to give advice, to close the woman up and let her alone. That is the way we do when we get cases in which there is gangrene of the small intestine from thrombosis of the superior mesenteric vessels, but I said, we will endeavor to find the cause of this trouble, and that fact saved the woman's life.

THE TOXIC THYROID
ITS TREATMENT UNDER ETHER-OIL-COLONIC ANESTHESIA

By G. K. Dickinson, M.D., Jersey City, N. J.

LITTLE things in sanitation lead to health; in medicine they may save the hundredth man. The cemetery of surgery is full of neglected detail. Clear thinking in accurate diction is to truth as the rising sun. The nomenclature of diseases in a dead language is but a "proprietary" name. Pathology resides in all tissues. Few have symptoms. "Thyrotoxic goiter" is an incomplete and incompetent term, although a serviceable tag. The name of this condition is its definition in *physiologic* terms: "over-active thyroid with a perverted secretion, an over-active adrenal, excessive formation of glycogen and a psyche". All are as one. The thyroid and the psyche are more evident, hence the various cognomens. All four of these tissues must be carefully considered to reap the greatest fortune in therapy. We do not think of the liver or adrenals, but focus on the mystical thyroid and many ignore the psyche.

The little things in life are our most trustworthy indications. *Why* does the adrenal man push away all the table appointments near him when he sits down to eat? *Why* is it discourteous to pass in front of a person? *Why* does a bed facing a close-to wall annoy the sick? *Why* do the ailing feel disturbed when some one stands at the foot of the bed? There is affront in all these little acts, while slapping a man on the back is a most kindly greeting.

The earliest path made into the mind by our perceptions was through fear. Communal life—the great struggle—varies it to jealousy, and this path is never closed. The sick, the weary, the worried are the most sensitive, and more ready for protection and coddling. The toxic goiter may turn an emotion into a panic. Thyrotoxemia is chronic fear, waiting for the touch, and a little may suffice to make the thyroid metabolize, the adrenal energize, and the liver feed. Knowledge of one's condition, that an operation is indicated and preparations being made for same, may be the last strain, where ignorance of plans and the gentle-voiced nurse are the all.

When we began in surgery, a good many years ago, the four strongest men in the hospital were assigned to the limbs, and "yours truly" held the cone. It was soaked with ether and pushed to the face. There was intense fright, struggling, and an effort to throw off those who held them down. Sometimes the patients were successful, making us run for our lives into closets, up to the roof or down the street. The pathway to the psyche was strongly stimulated and its ever-ready organs of reciprocation, the thyroid, adrenals and liver, responded.

We have the Mayos to thank for teaching the best technic to every young surgeon in the land, and we have Crile to thank for his preachment that a true surgeon must consider the psyche, that the best interest of the patient aside from the operation is in developing a sense of innate tenderness. This is the anoci-association which he has given us with reiteration. No more important factor has been developed and instilled into surgery than this. Well we recollect the mental effect of watching Orth handle a brain as with affection! There are few Criles in the country and few Lakeside Hospitals, and many surgeons are not intellectually, or, we may say, morally adapted to carry out the details of the anoci, and sad it is there are some hospitals not sufficiently cooperative to aid in the same.

When Gwathmey conceived the idea of rectal anesthesia he gave us a substitute which may prove of immense value to those who feel called upon to do thyroid work or surgery with those easily affected by fear. Founded on the important fact that ether evaporates from a solution of oil with methematical precision, not varying in quantity or time, he has discovered a method which seems eminently safe. As no method is fool-proof, so this should be given with discretion.

The whole history of ether anesthesia is based upon the inhalation method. What we know is ether plus such irritating effect as it may have upon the lung and its reflexes. Under the new method, the patient enters the hospital, is placed in a quiet room, visitations reduced, carbohydrate diet instituted, water liberally given, and a kindly nurse familiar with the method put in charge. The man is given to understand that he is to receive the treatment most beneficial to him. Every day he is placed in the Sims position, the room darkened, and a hypodermic of water administered. In half an hour a catheter is introduced into the rectum and a few ounces of water thrown in, the catheter being allowed to remain in with the clip attacked. After this has been done for several days, instead of the water enema, 2 drams of paraldehyde and the same amount of ether are introduced. A half hour later a hypodermic of morphine-atropin is administered, and in another half hour 65 per cent ether and olive oil are allowed to run in at the rate of an ounce a minute until six, or not more than eight, ounces are introduced, the catheter being allowed to remain in with a clip. In three minutes there is the odor of ether on the patient's breath and he demonstrates all the signs of somnolence, dropping gradually and smoothly into the most delightful slumber, during all this time not the least conscious of any variation from the usual routine.

To any one who has witnessed anesthesia by the inhalation method, then watches the most delightful, childlike slumber of the person under rectal anesthesia there will be a great and comforting surprise. The cone to the face, even with gas-oxygen, is an affront. Those who prefer local anesthesia also give affront by their presence and manipulation,

but the surgeon who quietly steals up behind and induces anesthesia per anum does not in any way disturb the psyche, and the chain of reactions so detrimental are not instituted.

Let us never fail to recognize the importance of little things, that truth may be hidden by convention, and that to insult a tissue in rudeness is to affront the higher centers.

"Truth forever on the scaffold,
Wrong forever on the throne,
Yet that scaffold sways the future
And behind the dim Unknown
Standeth God within the shadow
Keeping watch above His own".

Lowell.

THE GEHRUNG PESSARY FOR THE RELIEF OF CYSTOCELE

By Edward J. Ill, M.D., F.A.C.S., Newark, N. J.

In Vol. XIII, page 513 of the *American Journal of Obstetrics and Diseases of Women*, there appeared an article on "The Mechanical Treatment of Cystocele and Procidentia Uteri" by Eugene C. Gehrung of St. Louis. How much attention was paid to that excellent paper we do not remember. Suffice it to say that contemporary gynecologists know little about it, and still less about the use of Gehrung's pessary, which in our hands has been so valuable in the relief of many patients.

The writer is aware that papers which do not describe new operations are rarely popular. But now and then it is wise to hearken back to the older writers and find out what they did to relieve suffering women when gynecologic operations were in their infancy and fraught with great danger. The writer has lived through the period when the pathology and anatomy of the pelvic organs was little understood. Treatment was often empirical and not founded on a true understanding of the pathology. The writer does not say that we, at the present day, know it all, there is still much to be learned. Let those who ridicule the forefathers beware that a like punishment may not fall upon themselves. The more we advance in years the greater becomes our respect for our predecessors. Instruments of precision were few. The laboratory, the refuge of the unobservant, did not exist. Physiology, the clinical picture, and the physiognomy of disease, were the main reliance in diagnosis. All these cannot be supplanted by the laboratory. The writer has no desire to decry the laboratory and in his own community he was the first to develop and employ its facilities. This acknowledgement is made so that he may not be misunderstood in his advice to hearken back to the older authors in looking for relief for his patients when operations are out of question. Among these we find the old and decrepit, those with decompensated cardiac disease, and those with diabetes or advanced renal lesions. Then we have those with pulmonary affections contraindicating anesthesia, and lastly the timid ones.

The writer has not grown timid in his latter days. His enthusiasm often needs the curbing of sounder judgment and often reconsideration, and he never forgets the rule: "put yourself in the patient's place." To introduce to you so old a subject as the Gehrung pessary needs some excuse; but more than that, a deep-seated and mature consideration of its value. There are many expert gynecologists who decry the use of any pessary because of ignorance or selfishness, or because they believe it is harmful. Let that be as it may. A rehearsal of the case that prompted this paper will suffice to act as an excuse for its inflic-

tion. Mrs. E., aged fifty-six years, was referred January 3, 1914, by a Pittsburgh friend and a gynecologist of high standing. She had changed her domicile temporarily from that city to one in the writer's neighborhood. She had suffered much with cardiovascular disease and a cystocele that gave her great annoyance. She was a heavy, stout woman, who soon grew cyanotic on the examining table. Her systolic blood pressure was 220, though her urine was fairly normal. An operation was out of question, and this my Pittsburgh friend had already decided for me. We introduced a well fitting Gehrung pessary in her case, which not only gave her great relief, but made exercise so bearable, that it improved her general health. Of course the instrument was carefully looked after, as all pessaries should be.

In due time she returned to Pittsburgh to find that her doctor could not replace the instrument after he had removed it. He had never seen such an instrument. And well might a man be puzzled with it. The

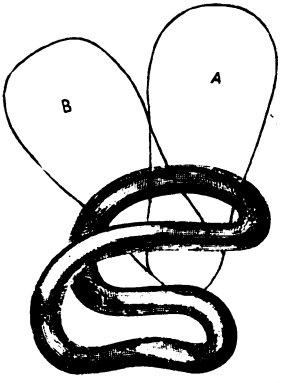

Fig. 1.—Showing position of the Gehrung pessary in relation to the uterus (*A* and *B*). *S*, Symphyseal end; *L*, left; *R*, right arm.

woman returned to Newark to have the instrument replaced. Later her family moved to Virginia, near Washington, but to my dismay she again returned to Newark because no one could be found to replace the instrument properly.

It is not the writer's intention to read to you his views as to the interposition operation of Watkins; suffice it to say that nothing has given him greater satisfaction, and to his patients greater relief, unless it be the operation for vesicovaginal fistula or the repair of a complete perineal laceration. You will understand, therefore, that this form of pessary is purely for those cases where an operation is not advisable.

The pessary consists of the Hodge instrument bent on itself so as to form a double horseshoe, one lever being a little shorter than the other. Its object is to hold up the anterior wall of the vagina and, with it, the bladder. Dr. Gehrung's views of the causation of the cystocele are based on the hydraulic pressure extended on a vagina which had lost its anterior fixation. In his own words: "If the bladder can be returned

and held in its normal place, the procidentia as such must be cured." There are some cases where the pessary will not do what we expect of it, nor will it even be tolerated. First among these is extreme relaxation and atrophy of the pelvic floor; second, deep, hard, and unyielding scars in the lateral fornices; third, the atrophic vagina as shown by its stringy character; and last, the various forms of procidentia with their concomitant hypertrophy. To men of experience this needs no further elaboration.

The position of the pessary is such that the smaller horseshoe or lever will be placed anterior and below the cervix, while the larger one will be just above the neck of the bladder. The junction of the two horseshoes will remain in both lateral fornices. To fit well the pessary should be freely moveable and not felt by the patient on walking or sitting down. In fact she should not be conscious of wearing the instrument except that she is comfortable, that she has lost the dragging sensations and the irritable bladder.

The introduction of the instrument is rather difficult to describe. The pessary is held between the thumb and the fingers of the right hand by the rounded end of the horseshoe, the smaller one being forward. The connection between the horseshoe to the patient's left is introduced first and then with a rotary motion of 180° the whole pessary is slipped into the vagina where another rotation of 180° will put it in place. Care should be taken that neither horseshoe slips behind the cervix in which case it will have to be removed and reintroduced, for the cervix will form a bar over which the pessary cannot be slipped. Its position is best shown by Gehrung's woodcut or by the illustration in the Tieman & Co. catalogue. It goes without saying that experience and trial only can determine the proper size of the instrument to be used for each case. It is better to start with a small size pessary and allow the patient to walk about the office as a test, than to use a large size instrument which may produce pain and injury. Gehrung says: "The pessary acts by a close application to the anterior and lateral walls of the vagina. It gets its inferior support on the lateral parts of the perineum." Those who will take the trouble and patience to master it will find great satisfaction for themselves and secure immeasurable relief for their patients. The great objection to the pessary is that while the patient can remove it she cannot replace it, Gehrung to the contrary notwithstanding.

It is not within the province of this paper to criticize that which we take to be in error in Gehrung's paper. Possibly it will be better to say that we have not been able to do all that he has succeeded in doing. My object is simply to show how we may hold up the anterior wall of the vagina with a properly fitted Gehrung pessary.

DISCUSSION

DR. ABRAHAM J. RONGY, NEW YORK CITY.—I was confronted with the same problem in the case of a woman who has had a high blood pressure and also a complete procidentia for a great number of years. Another woman, seventy-two years of age, had a complete procidentia and was very miserable. No mechanical manipulation could retain the uterus in the vagina, so I decided to operate on these patients, resorting to sacral anesthesia, and the only pain the women had was when I entered the anterior fold of the peritoneum and after that they had no pain whatsoever.

As to the question of the use of pessaries, I have tried every pessary on the market, and I have come to the conclusion that the only way to use a pessary is to make it and mould it in the office according to the dimensions of the vagina. The only contrivance that will hold a heavy uterus in a relaxed vagina is a soft rubber pessary which will fit around the cervix, and this supported by a hard rubber pessary. The hard rubber pessary will distend the vagina, and the soft rubber pessary will prevent the cervix from coming down.

DR. CHARLES L. BONIFIELD, CINCINNATI, O.—The use of pessaries has gone out of fashion and I explain to patients when I use a pessary that it is not a curative agent, but enables them to be up and around like a crutch enables one with a broken leg to do so. Many gynecologists of the younger generation do not understand the principle upon which the pessary acts. The effects of a good retroversion or retroflexion pessary is practically the action of shortening the uterosacral ligaments; it pulls the uterosacral ligaments over the lever put up behind the uterus. A retroversion or retroflexion pessary will never act satisfactorily unless the patient has a normal posterior culdesac. A second requisite for a pessary to work properly is a vagina with sufficient muscular coat to hold the pessary in position.

DR. HERMAN LORBER, NEW YORK, N. Y. (by invitation).—I want to say that under the instruction and guidance of Dr. Herman J. Boldt we have used the Gehrung pessary for fifteen years. We have often made these pessaries out of round hard rubber pessaries. The front bar should rest behind the symphysis and the cervix in the concavity between the two bars. It takes up the slack in the vagina and the front bar resting behind the symphysis prevents the bladder from coming down. It will often work when no other pessary will act satisfactorily.

DR. K. ISADORE SANES, PITTSBURGH, PENNSYLVANIA.—I have been using the Gehrung pessary with excellent results. Whether the position as shown by the essayist is the only correct one I do not know. As I insert it the pessary lies with its concavity up so that its narrower two bars are in the lateral fornices.

DR. ILL (closing the discussion).—I want to emphasize the fact that this pessary is for the purpose of holding up a cystocele of moderate extent. It should be used only in patients in whom we cannot operate. Gehrung has worked out this form of pessary with such success, I do not see how it can be improved.

ENURESIS

By John W. Keefe, M.D., F.A.C.S., Providence, R. I.

ENURESIS, or lack of control of the act of micturition, is found with sufficient frequency to merit our attention, in order that we may study its causes and formulate definite methods of treatment for the relief of those so distressingly afflicted.

Examinations for entrance into the army revealed a surprisingly large number of adults who were found to lack control of the vesical sphincter during sleep and some who had no control either day or night.

As these men were totally unfitted for army life, it was decided in several camps, to segregate them and submit them to treatment, with the hope of effecting a cure; and in many instances these methods were attended with success.

Certain, aggravated types which did not respond to treatment were discharged; when this became known it led to many cases of malingering. These were readily detected, however, at one of the camps, by awakening the men suspected an hour before the usual time for arising. The bed was found dry, as these men, not wishing to sleep in a wet bed, had made a practice of deliberately urinating in the bed just before arising.

Goltz in 1874 described the physiology of normal urination as follows: The gradual distention of the bladder, induces rhythmic contractions of its walls, these contractions increase until a few drops of urine are expressed into the posterior urethra, producing a stimulus. The afferent part of the reflex passes to its nerve center in the lumbosacral cord whence arise the efferent impulses, by which the bladder is made to contract vigorously and the vesical sphincter to relax.

This mechanism is also under the control of the will; so that micturition can occur before the bladder is full and also the action of the reflex may be prevented by a voluntary exercise of the will power. Since this is so, the point which I wish especially to present for your consideration is the rôle of the psychic factor in micturition.

The brain cells must be educated or definitely impressed with the necessity of control of the vesical sphincter and bladder wall during waking hours. These impressions must be deep and lasting in order to continue the control of micturition in the subconscious state or during sleep.

We are all conversant with the fact that many persons before going to sleep are able to will that they shall awaken at a definite hour in the morning and so deep an impression is made upon their brain cells that the minutes and hours are subconsciously measured while they sleep. The normal child, at the end of the third year, has gained control of the

vesical sphincter. Osler states that enuresis usually clears up by the end of the first decade.

The etiology of enuresis is obscure. The causes set forth are so numerous that one cannot fail to observe how prone we are to confound cause and effect. Tonsils and adenoids are said to be offenders, yet nocturnal incontinence persisted without relief after removal of the adenoids and tonsils, in thirty-six out of about one hundred cases, as recorded by Grover. Circumcision has been done and cures reported, yet in a large series of cases, fifty-one per cent of the boys had been circumcised and had continued to wet the bed. Malformations, adhesions around the clitoris, phimosis, pinworms, malnutrition and deficiency of thyroid secretions have been enumerated with other causes of enuresis. While these conditions may play a minor part, they certainly are not the primary factors. Heredity plays a very important rôle, as the history so often reveals a like condition among the brothers, sisters, uncles or aunts, or a family history of neuropathic tendencies, often with a sensitive and unstable nervous system. That there is a congenital lack of general systemic tone and a tendency to neuromuscular fatigue, as predominating influences, is quite evident.

Enuresis should be considered a psychophysiologic defect as being a manifestation of Adler's theory of inherited organ inferiority. We find it associated with certain borderline defects of mentality and deficient character formation. By bearing in mind that mental retardation or inferiority is the prime factor, we should more readily be able to outline a rational method of treatment. Very few cases show evidences of cystitis and of these, many responded to local treatment of the cystitis.

Cystoscopic examinations revealed in a number of patients a trabeculated bladder, especially at its base and in the region of the trigone, which may very well be the effect rather than the cause of the trouble. A contracted bladder is commonly found in cases of enuresis of long standing and requires gradual, daily distention with boric acid solution. Many patients show evidences of an insufficiency of food or a badly adjusted dietary, which of course should be corrected.

The diet should consist of milk, eggs, cereals and vegetables with very little meat. A light supper should be taken with no water, after four o'clock in the afternoon. Rest, avoidance of excitement and long hours of study, a moderate amount of exercise, and a general hygienic treatment should be instituted.

The environment of the patient should be inquired into. We may find an unwise attitude of the nurse or mother towards the child, necessitating the changing of the nurse or even the removal of the child to a hospital, where systematic treatment can be administered, and measures taken to improve the mental and moral development of the patient. Mental suggestion, or suggestion during the hypnotic state, or just before going to sleep should be practiced in order to impress the subconscious

mind with the necessity of the act of urination. The decided response to psychotherapy is often striking. Rewards and mild punishments have been at times helpful. The patient should be awakened every hour and asked to urinate, in order that we may anticipate the involuntary, by a voluntary emptying of the bladder. The intervals between the acts of urination may be gradually lengthened, until the habit of control is established. The passing of urethral sounds or a bougie is often sufficient to arouse the control mechanism of micturition. Hot sounds have been used with good effect.

Electrical treatment has also been found efficacious. A rhythmically, interrupted, sinusoidal or faradic current is made to pass through the region of the bladder, for fifteen minutes daily, for a period of from two to four weeks. As high as 60 per cent of cases have been cured by this treatment. Stimulating the prostatic urethra with the electrical current has also resulted in cures. Extreme cases have been relieved by injecting into the spinal canal 12 c.c. of a physiologic sodium chloride solution after the withdrawal of 10 c.c. of the cerebrospinal fluid, the rationale of which is perhaps other than that which its proposers suggest. Wearing a rubber urinal has been known to create a normal control of the act of micturition.

Medicines have been found of but slight value. Many of the cures attributed to electricity, spinal puncture and operations are due to the mental impressions made in the brain, upon the subconscious mind, which arouses the control mechanism of micturition, causing it to act during sleep.

To illustrate the predominance of the psychic element in the act of urination, I shall cite the case of a young woman, about twenty-two years old, who consulted me because she was unable to urinate when away from her home, with the exception of a certain water closet adjoining a room where she worked as a weaver in a mill. When she was transferred to another room in the same mill she was unable to urinate in the closet adjoining this second room. When visiting a nearby city, she was unable to urinate from the time she left home in the morning until she returned at night.

And as a further illustration of a similar psychic influence, I may mention the following case related to me by a colleague: A man, when travelling on a train, spent most of the night walking to and fro from his berth to the urinal. In order to obviate this, he took an empty hot water bottle to bed with him, so that, if he desired, he might urinate into the bottle; but to his surprise he did not have occasion to use the bottle. However, if he forgot to take the precaution of providing himself with the hot water bottle while travelling at night he again found it necessary to go to the closet every half hour. I should like to mention another case of a girl, aged nine, who had wet the bed since infancy. A cystoscopic examination revealed a congested area about the trigone.

It was necessary to dilate the urethra to admit the cystoscope. Just the administration of the ether and the dilation of the urethra, aided by suggestion, I believe, was sufficient to impress the control mechanism of the act of micturition, so that the patient did not wet the bed during the following week. This is rather remarkable when we consider that she had nocturnal incontinence practically all her life. Subsequent passage of sounds and distention of the bladder with boric acid solution, aided by suggestion, has resulted in a cure.

We all have had our attention called to the fact of the difficulty experienced by many people when trying to urinate in the presence of others, showing the close relationship of mental impressions with the act of urination. And so it appears to me to be very important in the treatment of these cases, that we should constantly endeavor, not only to treat the bladder locally, but also to educate the mind of the patient, so that adult voluntary control shall supercede the infantile reflex type of micturition. In the absence of this education, we will many times fail to effect a cure of these patients.

Viewing the subject of enuresis broadly, we may arrive at the following conclusions.

First: Considering the multiplicity of measures that have been found to assist in the cure of enuresis, it would seem that underlying them all, must be some common factor, which is, I believe a psychophysiologic impression made upon the brain.

Second: Heredity undoubtedly plays an important rôle.

Third: These patients have a neurotic, unstable nervous system accompanied, many times, by mental retardation.

Fourth: Psychotherapy, mental suggestion and education of the subconscious mind should supplement any other form of treatment to the end that we may anticipate involuntary by voluntary micturition.

In a word, my contention is that the cure is the result of the mental awakening and stabilizing of the brain cells that control the act of micturition.

BIBLIOGRAPHY

Young, Hugh: Surg. Gynec., and Obst., Jan., 1919, xxviii, No. 1.
Emerson, W. R. P.: Am. Jour. Dis. Child., xv, No. 5, p. 339.
Caro: Jour. Am. Med. Assn., Feb. 15, 1919, lxxii, No. 7.
Pelzman: Mil. Surgeon, xliv, No. 4, p. 383.
Grover, Joseph, L.: Jour. Am. Med. Assn., Aug. 24, 1918, lxxi, No. 8.
Hoffman, Robert L.: Mil. Surgeon, xlv, No. 1, p. 107.
Johnson, F. H.: The Practitioner, May, 1919, cii, No. 5.
Cameron, H. C.: The Practitioner, Feb., 1918, c, No. 2.

ENDOCRINE INFLUENCE, MENTAL AND PHYSICAL, IN WOMEN

By James E. King, M.D., Buffalo, N. Y.

MUCH of what is known in medicine has developed from theory. In every branch of medicine theory has formed a basis for observation and experimentation, leading to the establishment of some of the most important facts. Theories may arise entirely from the imagination, or, as is usually the case, a few known facts may inspire and suggest the theories from which are evolved the missing facts necessary to complete the knowledge. Even theories disproved possess in a negative way great value. Granting, therefore, the importance of theory in the progress of medicine, it is justifiable when all facts are not known, to evolve theories to interpret the phenomena of health and disease. Let this, therefore, be the excuse for presenting some fact and much theory upon the subject of the endocrine system and its influence upon the mental and physical characteristics of woman during her reproductive life.

At present no question in medicine is receiving greater and more deserved attention than the ductless glands. Twenty-five years ago they were not suspected of having any important function; today we are ascribing to the activity of these glands many mental and almost all physiologic processes and every department of medicine is seeking to establish its relationship to the endocrine system. The subject affords an interesting and fruitful field for speculation and experimentation and, as a result of the efforts of a host of observers, some real knowledge is being accumulated. Every new fact affords a nucleus for new theories, until the student of endocrinology now finds himself wandering in a hopeless maze.

The biologist has reduced the laws of life to two great fundamentals; the preservation of self and the propagation of kind. For self-preservation are found various adaptations for self-protection, to which may be added the elaborate mechanism for metabolism necessary to existence. The higher in the scale of animal life, the more complicated these processes, until in man is found a brain capable of reasoning, by virtue of which he has attained his position superior to all other forms of life. There is now no question as to the influence of the ductless glands upon man's vital physiologic processes, and recent studies are making it apparent that the endocrine system in all probability is also the basic factor in shaping and influencing his mental processes and emotions. Thus rage and fear, so essential to self-preservation, in the lower animals as well as man, are manifested in physical reactions brought about by an

increased discharge from certain of the ductless glands. If, therefore, it may be conceded that self-preservation depends upon the endocrine system, one can even more willingly concede the influence of these glands upon reproduction. Indeed, the earliest knowledge of the ductless glands was the rôle they played in the development of the secondary sex characteristics and their function in reproduction. More than a suspicion now exists that from them originate also the various emotions and mental states accompanying reproduction. It would seem, therefore, that we may, with no stretch of the imagination or violence to reason, concede that the endocrine system is of fundamental importance in the fulfillments of the two great laws of nature and in man is the activating influence in the mental processes growing out of these laws.

In a discussion of any subject bearing upon the ductless glands, certain facts and theories must be kept clearly in mind. Of these the foremost is the fact that there exists normally between the glands a most intimate and well balanced relationship. Abnormal or perverted secretion of one gland means disturbance and necessary readjustment of the others. Theory explains this interrelationship by assuming certain activating and inhibitory influences exerted by one gland over another. Another fact well established is that the action of these glands is produced by the introduction into the circulation of a biochemical substance of the greatest potency. It has further been clearly demonstrated that the same or an allied active principle may be found in two or more glands, which increases the difficulty and adds to the confusion in understanding their individual action. That mental processes may be influenced and determined by the secretion of the ductless glands rests largely on theory, but observation in health and disease has given such clear proof of this in some instances, that it justifies our assuming much more. It is not difficult to believe that human action may be prompted and influenced by a substance in the circulation, if the effect of morphine, atropine, cocaine, alcohol and other drugs is borne in mind. One of the best examples of the effect of the internal secretion on mentality is noted in acromegaly. Early in the disease, during the period of hyperpituitary secretion, the individual becomes alert and keen in all his mental processes, and may exhibit even unusual mental power, but when hypergives way to hyposecretion he quickly becomes dull and stupid. The mental improvement in the cretin under the administration of thyroid also bears upon the subject. Cushing and others have even called attention to certain types of mental derangement which may be due to or largely influenced by perverted glandular secretion. In estimating, however, the effects of internal secretion upon the mind, confusing and conflicting deductions may be drawn, unless one gives proper values to the influence exerted by education, environment, and custom.

By reproduction in mammals, is understood the fertilization and development of the ovum and its expulsion at maturity. In the human

species, however, reproduction comprehends much more. It really includes all of the associated factors which lead up to and make possible fertilization. This would recognize in both sexes the influence of the mental and emotional states which accompany the various phases in reproduction and in the female the phenomena of the menstrual cycle. With the exception of love, which is really only the intellectual refinement of ovarian and testicular influence, the emotions associated with reproduction have received scant consideration. The observing student, however, will find plausible explanation in the ductless glands for some of the curious mental states exhibited by women.

The beginning of the reproductive life in both male and female is designated as puberty. Up to this time the male and female are much alike mentally and physically, but with the appearance of secondary sex characteristics the two sexes diverge widely. The male is attracted to the female and his sexual impulses inspire love and passion; physically, he is capable of impregnating. After his reproductive life is once inaugurated, however, it is marked by no physiologic events other than the impregnation of the female. Gradually his reproductive powers wane until he finally becomes impotent at an age varying in different individuals. In the female, puberty is marked by more clear cut physical and mental changes. There is established at this time the reproductive cycle, which continues until the age of forty-five, when her reproductive powers are brought suddenly to a close. During this period of thirty years her life is punctuated by menstruation, pregnancies, child-bearing, and lactation, and finally, with more or less disturbance, she passes through the menopause. A woman's physiologic processes, therefore, after satisfying the requirements for her existence, are for this period manifestly consecrated to reproduction. A woman for thirty years may be regarded as a reproductive machine whose mechanism is in constant action and which only waits to receive the proper stimulus to turn out a finished product. There are marked physical reactions in the various phases of the reproductive cycle, and it is therefore not unreasonable to expect evidence of mental reaction as well.

MENSTRUATION

The physical changes in the female at puberty are matters of such common observation that they need not be discussed here. Every thoughtful student, however, asks himself why at the age of fourteen these changes should take place. A plausible basis for the answer is found in the results of experimentation. In young animals removal of the thymus causes precocious sexual development. It has also been shown that removal of the posterior lobe of the pituitary in animals, or disease of this gland in man, results either in failure of the sex characteristics to appear, or in reversion to the infantile type, depending upon the age of the animal or individual observed. These are undisputed facts which clearly establish the relationship of these glands to each other and the

important rôle they play at puberty. It may be assumed that the thymus during the years of childhood exerts an inhibitory influence upon the pituitary. Gradually thymus atrophy takes place, being more or less complete at the age of fourteen. The pituitary being thus released from the restraining influence of the thymus, becomes active and stimulates the ovary. This results in the activation of the interstitial cells, and the consequent development of the secondary sex characteristics. The corpus luteum develops from the Graafian follicle and menstruation and ovulation are now established. Not only does the pituitary initiate these changes, but it is also necessary for the continuance of normal ovarian function. So important is this relationship that the pituitary in large measure is to be regarded as a sex gland. During the past few years it has been established that the corpus luteum also has a distinct secretion. In 1914 Seitz, Wintz and Fingerhut presented a series of studies in which they claimed to have isolated from the corpus luteum two distinct substances, one of which influences the time of menstruation and the other the amount of flow. If their observations are correct, certain types of abnormal menstruation find ready explanation.

The mental states associated with puberty and menstruation are interesting. At puberty the girl acquires quickly the mental attributes of womanhood. There naturally exists in different races and states of civilization a wide range of modification, but in all may be seen the transition of the child mind to the mind of woman. The girl of every race becomes self-conscious, and through the influences of civilization and education this self-consciousness develops into what we term modesty. The tendencies shown by the girl after puberty are also of considerable interest. In some are seen the fondness for out-of-door life and rough sports, while others are indolent and satisfied with a life of inaction. There is good reason to suspect that such tendencies are determined largely by internal secretion, the thyroid probably playing an important part. The mental states during menstruation are often most striking. Frequently there is a tendency to melancholia and impairment of mental efficiency. Such manifestations are so common that they may be regarded as normal. Beyond these normal manifestations there are varying degrees of mental disturbance. The most common of the more pronounced effects is the exhibition of suspicion and unreasonableness, which in certain women may attain the degree that the alienist characterizes as "psychic hysteria." These women at menstruation are utterly unreasonable and illogical. They deliberately construe every act and word into a meaning widely different from that intended. The most trivial and innocent remark of others will be distorted and perverted in such a way as to awaken a sense of injustice and self-pity. Tears and anger alternate and often physical violence is attempted. Women who ordinarily are sweet tempered and lovable are at these times so entirely changed that they become the feminine prototype of a Dr.

Jekyl and Mr. Hyde. One of the curious accompaniments of these states is the physical expression of the mental condition seen in the tendency to work. Women under this influence are restless and will work from early until late at the most strenuous menial labor. Remonstrance from the household calls forth perhaps a flood of angry tears, and only sheer exhaustion will at length compel them to the rest which finally restores them to normal. Results obtained from the experimental study of the action and influence of the adrenals in anger and various forms of physical exertion, would suggest that in the disturbed endocrine balance of these women at menstruation a hyperadrenalin secretion takes place. Another manifestation analogous to the last, but somewhat differently expressed, is seen in those women whose principal symptom is an intense headache, accompanied usually by vomiting. These women are completely incapacitated and each period is anticipated with dread and fear. The condition in some respects bears a close resemblance to a migraine and would indicate some cerebral vasomotor disturbance. The fact that removal of the ovaries cures these patients points to a perverted secretion of the corpus luteum as the probable causal agent.

Beside the disturbances clearly traceable to menstruation it has been well known that all mental conditions and tendencies are much exaggerated during the menstrual period. In the interesting book of Havelock Ellis it is stated that Lombroso found out of eighty women arrested for opposition to the police or for assault all but nine were menstruating at the time. Krugelstein stated that in 107 instances of suicide in women which had come under his observation in all the act was committed at the menstrual period. While so great a number would not be found in every series of suicides in women, in a very large percentage this would be true.

PREGNANCY

The physical evidences of glandular activity during pregnancy are most striking and profound. Not only are seen marked changes pertaining directly to the reproductive system but also changes in metabolism. A woman during pregnancy is on the threshold of pathology and it would appear that her border line position might be accounted for by an imperfect readjustment of her endocrine balance. Sajous has argued convincingly for the value of normal adrenal and thyroid secretion in infections and it is not unlikely that the derangement of these glands in pregnancy accounts for the subnormal resistance to infectious diseases shown by pregnant women. Perhaps here we have the explanation for the high death rate among pregnant women during the recent influenza epidemic. The relationship of the ductless glands to pregnancy is almost an untouched field. It is only in the occasional departure from normal that we are permitted to obtain a glimpse of the wonderful and powerful forces that inaugurate and

accomplish those marvelous changes associated with gestation. We stand helpless to explain the complex and subtle influence exerted by these forces, for our knowledge is not yet sufficient to even inspire our imagination to evolve reasonable theories. How shall we explain the breast changes during pregnancy? It surely bespeaks the activation of the mammary glands by some powerful influence, but we can only theorize on the probable source. And what of the enlargement of the thyroid? Is such hypertrophy a compensatory one to furnish a substance to neutralize the increased and unusual toxins elaborated by mother and fetus? There would seem to be much to indicate that this is the case. The influence of the adrenals is seen in the normal and exaggerated pigmentation, but who shall say why or how? Our knowledge of the influence of the pituitary during pregnancy is based upon some real facts, and it is now possible to ascribe to this gland certain manifestations of disturbed metabolism seen during, and following in the wake of pregnancy. The changes in the pituitary itself which take place in pregnant animals are now known to be duplicated in woman. The enlargement of the pituitary which occurs is undoubtedly due to the characteristic pregnancy cells. Just what influence these cells exert is not known. An unusual hypertrophy of the gland so great as to cause pressure upon the optic nerves, accounts for certain instances of total or partial blindness sometimes encountered. The rapid increase in weight so commonly noted in pregnant women indicates a disturbed carbohydrate metabolism of pituitary origin. In this connection Cushing has pointed out that in some of these women may be seen thick lips and a dull expression, accompanied by high sugar tolerance, suggesting acromegaly.

The reason for the onset of labor has been a question that has perplexed the physiologist. There will one day probably be proof that uterine contractions at term are initiated by a liberation of pituitrin through the withdrawal of some inhibiting influence exerted upon the gland during pregnancy. There is even now very good reason to regard the corpus luteum as the source of the inhibiting agent.

When one considers the physical readjustment which takes place during pregnancy and the pleasurable anticipation or dread which such a condition inspires, it is not surprising that every thoughtful woman of normal intelligence should pass through the experience with some mental reaction. Normally every woman is endowed with a love of offspring, but these natural impulses and feelings may be entirely dominated and submerged by social influences. It is unfortunate that environment, conventions of society, and the struggle for existence, should sometimes determine the mental state of pregnant women. Happily, however, the natural tendencies usually overbalance these artificial influences. Women who in the early weeks of pregnancy are willing to undergo any danger to be rid of pregnancy, as term approaches gradually experience

a change of feeling and at delivery are reconciled and happy. We are enchanted by the great mother love displayed by the lower animals. We do not assume that in animals such a protective love is based upon intelligence or reason, so we characterize it as mother instinct. Equally striking is the sudden revulsion of feeling which is observed when the young have reached an age to care for themselves. The mother dog renounces her puppies and snaps at them; the hen, who has expended so much protective care on her chicks, will suddenly drive away the brood which she has so faithfully provided for. Undoubtedly this so-called instinct arises from some secretory influence, probably the pituitary, which for a time prompts the mother love. As the young grow it is provided that the stimulus for mother love be withdrawn and the pituitary relapsing to normal, the animal cares no more for her young and the reproductive cycle is again begun. We have no justification for a belief that the human species is devoid of such an influence. In man's conceit it is pleasant to attribute mother love entirely to the intellect, but unquestionably the impelling force in woman is the same that is found in the lower animals, but one which is glorified by a reasoning intelligence.

Another attribute of the mother that stands out prominently, is courage. The hen is known to be a timorous bird, yet when caring for her brood of little chicks she will exhibit most extraordinary courage in the face of overwhelming dangers. The same is noted in other animals. We cannot attribute this courage to reasoning. It must be the result of some physical stimulus which prompts these animals to this unusual action. Indeed, so strong is this stimulus that often a mother will give her life in the protection of her young. It would seem that the influence which inspires a mother's love may even reverse the natural order of the two fundamental laws and the first great law of nature be relegated to second place.

Bearing upon the mental states of women during pregnancy is a curious manifestation which comes within the scope of pathology. Two years ago the writer described this condition and gave to it the name of "pseudocyesis of hypophyseal dystrophy." It presents a clearcut syndrome and is characterized by rapid increase in weight, perhaps fifty or sixty pounds within a few months. Menstruation either ceases or is much diminished in amount and frequency. The facial expression becomes listless and the woman has little strength and endurance together with the high sugar tolerance that is seen with pituitary derangement. The outstanding feature, however, is the peculiar obsession of pregnancy. These women will cling tenaciously to a belief in pregnancy in the face of expert testimony which ordinarily would convince them. The physician who questions the diagnosis is a fool and the woman continues her preparation for the labor. At a time which she believes to be term the doctor and nurse are often summoned and it is only when no baby comes that

the proof is sufficient to destroy her hope. The underlying condition of glandular disturbance in these patients is usually overlooked and the physician is only consulted concerning the pregnancy. There is much argument in favor of the deranged pituitary activating the mental state of these women. An analogy may be found in the hen who wants to set and who persists in her attempts despite the strenuous and vigorous means used to convince her of her mistake.

MENOPAUSE

Every woman looks forward to the change of life with some apprehension. In the physical changes noted at this period can be seen unquestionable endocrine influence. Inasmuch as the same change may be brought about by removal of the ovaries in young women, it is unquestionably the loss of ovarian secretions that accomplishes the physical changes. The question as to whether the ovarian atrophy is a result of some influence emanating from other glands has not been settled. So far as is known today, the ovaries atrophy much as does the thymus at the earlier period of life. On account of the intimate relationship of the ovaries and the other glands of internal secretion, withdrawal of ovarian secretion would naturally result in some disturbance of the other glands. This may be evidenced either in hypo- or hyperactivity. The most common, however, is the hypothyroidism indicated by increase in weight and the tendency to uterine bleeding and in extreme cases the picture of myxedema. The vasomotor effects as shown in the so-called "hot flashes" suggest the adrenals as a participating factor.

The mental states seen during the menopause are well known and are characterized by a tendency to melancholia and even insanities. It is a common observation that women whose mental balance is not secure are especially prone at this period to develop emotional insanity. There can be no question but that in a certain number of instances the mental state is precipitated by the disturbance of the endocrine balance.

Woman has never been understood by man. She is a creature swayed by moods and impulses. She may attain virtues to which no man can aspire or she may sink to depths unfathomed by his imagination. We pay tribute to her virtues and marvel at her iniquities. For ages she has been the theme of poet and philosopher but neither imagination nor wisdom has solved her. Shall we not perhaps find the answer in a better understanding of these subtle influences which determine her physical life? Can we expect the periodic readjustments of so delicate a mechanism operated by such powerful interdependent forces to functionate ever smoothly without some physical or psychical reaction? We cannot expect to understand woman until we have fathomed these forces that inspire her impulses and dominate her existence. The wave of feminism that swept over the country raised a disquieting fear in the breast of some timid souls that man's place would be usurped by

woman. There may appear from time to time an unmarried female who by reason of education and sheer force of will is able to dominate her internal secretions and assume certain prerogatives of man but never until evolution has eliminated her present endocrine glands will woman be other than she always has been. The rôle she plays in life's scheme has too many changes and keeps her too occupied to permit of the mental adaptation necessary to a new order of things. Man should therefore view with kindly forebearance the futile effort of woman to overcome by her will the very powers that shape and control her mental processes.

But after all it would really seem that woman is the more important in life's plan. It is woman who activates man to all he does and all he thinks, and is it therefore fitting that we should feel a supremacy? But if we do assume that supremacy we should with all the more reason regard with indulgence those occasional aberrations in the orderly operation of her endocrine system and exclaim in a paraphrase of the well known line

"Woman with all thy glands we love thee still."

DISCUSSION

DR. WILLIAM M. BROWN, ROCHESTER, NEW YORK.—I understood Dr. King to make the statement that during pregnancy there was a high sugar tolerance. I have seen it stated and personally believe that during pregnancy there is a very low sugar tolerance.

DR. GEORGE W. CRILE, CLEVELAND, OHIO.—While listening to the fascinating and interesting paper of Dr. King, I recalled the fact that when some years ago we were doing experimental work, we found that the injection of extract of the placenta caused a very markedly increased output of adrenalin, and that it also produced a hyperchromatism of the brain cells. Adrenalin alone causes hyperchromatism of the brain cells. It would appear, therefore, that the placenta acts upon the adrenals directly. We all know that the thyroid gland governs and activates most of the body, including the other endocrine glands; and it has been shown that adrenalin will increase the activity of the thyroid. The enlargement of the thyroid gland during pregnancy, as well as during sexual activity, is very marked. This interaction is to be interpreted as Dr. King has suggested on a mechanistic basis. Dr. King's conception of human behavior, human evolution, and human development is more or less mechanistic, and is in accord with my own point of view that our further knowledge of the phenomena of pregnancy as of all other normal and pathologic phenomena will be better understood as we become better able to interpret them on a mechanistic basis.

DR. KING (closing the discussion).—Dr. Brown has asked regarding high sugar tolerance. Every pregnant woman has not high sugar toleration. It is only those that have the suggestion of acromegaly, and the physical changes and evidences of hypopituitary secretion.

There are many interesting things that might have been considered. In estimating the effect of these glands upon the mentality and the behavior of women, we must take into account environment and education and the natural surroundings of women, but fundamentally I believe, as Dr. Crile has indicated, that we shall find a great many of the impulses we have hitherto regarded as fundamentally due to the intellect to be due to the stimulus of the endocrine system.

1. ENCEPHALITIS COMPLICATING PREGNANCY NEAR TERM. 2. MALIGNANT DISEASE OF THE CERVIX IN A YOUNG PRIMIPARA

By William M. Brown, M.D., F.A.C.S., Rochester, N. Y.

CASE 1.—Encephalitis complicating pregnancy near term presents unusual difficulties of diagnosis. Mrs. V. S., American born, white, aged thirty-one, married six years and pregnant for the first time. Family history negative. She had had no serious illness, except the ordinary diseases of childhood. For several years she was subject to irregular and severe headaches. Menstrual life began at thirteen and was always regular and normal. The last period occurred July 24, 1919. The date of quickening was not noted, but labor was anticipated about April 30, 1920. There was very little vomiting during the early months of gestation, but on September 30 she had a very severe headache, both frontal and occipital. This headache recurred at irregular intervals during her pregnancy. In February, 1920, her eyes and nose were examined and reported normal. Bowels moved freely at all times. There was no edema. Frequent urine examinations showed normal renal function. The following month she called on her physician complaining of headache and a blurred vision; the systolic blood pressure was 126. She was sent to a hospital and placed on preeclamptic treatment, low protein and salt-free diet, and sulphate of magnesia to full catharsis. When admitted to the hospital, her temperature was 97°F., pulse 110, respiration 22, and blood pressure 118/77. On March 30, she still complained of dim vision and the ophthalmologic report was as follows: Pupillary reactions normal; tension of both eyes normal; counts fingers with either eye at four feet; there is a moderate retinitis. White areas not fully developed, and some exudate around the disk; vessels are hyperemic. The oculist's comment was "I doubt if patient can go to full term without permanently impairing her vision."

For the substance of the above history I am indebted to Dr. L. L. Button who asked me to see the case with him on the afternoon of March 30. During the two previous days her temperature fluctuated between 98.6° and 100° F. The blood pressure was 118/80.

After a careful examination of the patient and history, I was not convinced that it was an uncomplicated case of toxemia of pregnancy and advised further observation; but the other physicians and the relatives were so fearful of eclampsia and so convinced that her illness was due alone to her pregnant condition that I was persuaded to undertake immediate delivery because I could offer no satisfactory objection.

Abdominal delivery was elected as being the safest procedure for both mother and child. The operative record shows a preoperative diagnosis of "toxemia of pregnancy," with a reservation. A classical Cesarean section was performed through the supraumbilical incision. After delivery of the uterine contents and repair of the uterine wound, seven small-sized subserous fibroids were removed from the fundus. Before beginning the operation, a stomach tube was passed to relieve an extreme gastric dilatation.

The patient reacted well from the operation, but twenty-four hours later her temperature was 101° F., and thirty-six hours thereafter it had risen to 103°F. It then gradually receded until on the seventh day postpartum it touched normal; but immediately rose again to 103° F. where it remained most of the time for about

five days, when it became normal again and remained so for three days. During her entire illness a most embarrassing and obstinate abdominal distention was present. On April 11 a few crepitant râles were heard at the base of the right lung and on the fifteenth there was dullness and a small area of bronchial breathing. At this time I retired from the case and her own physician resumed her care.

On April 25, I was again called to see this patient. She had steadily improved and had been up in a wheel chair the day before. But on that very evening she had a severe convulsion of five minutes' duration. Her blood pressure was 130/80.

Patient complained of severe pain and tenderness in the left upper abdomen and back. There was marked rigidity of muscles of left side of the abdomen. April 27, there was increased stupor, marked Babinski sign in the left foot, and the left leg was flexed constantly. April 28, two convulsions. April 29, considerable pulmonary edema. Babinski sign present in both feet; pupils normal and react to light equally; can swallow well. April 28, a spinal tap was made. Pressure 60 mm. Globulin positive, two cells per mm. Bacteria none. A cystoscopy and ureteral catheterization showed normal condition of bladder and ureters. During this time the temperature ranged between 102° and 103°; the pulse between 120 and 130, and the respiration between 30 and 40. The blood contained 83 per cent polynuclear cells, and the gross white count ranged from 7840 to 16896. The blood urea nitrogen always remained about ten mgm. per 100 c.c.

April 27, a rapid abdominal exploration was made to decide the question of peritonitis. No pathology was found. Considerable rigidity of the neck was noticed at this time. The ophthalmologist again examined the eyes, under a mydriatic, and stated positively that the coma was not due to brain pressure. April 28, I was present during one of the convulsions and noticed that the seizure began in the index and middle fingers of the left hand and then gradually involved all other muscles of the body. I now abandoned every other diagnosis except encephalitis and gave a fatal prognosis. She died the following day. The post-mortem findings were as follows: Body length 65 inches; well developed and nourished. Rigor mortis in extremities. Surgical incision of abdomen undergoing normal healing. Pleural cavity; small filiform adhesions present in both sides. A small amount of fluid in both cavities. Pericardial cavity, about 60 c.c. of clear fluid except over the sac. Visceral surfaces smooth and normal. Abdominal cavity, peritoneal surfaces smooth and normal, except over the fundus of the uterus a few adhesions bind the healing uterus to the wall of the intestine. Lungs crepitant throughout, except in the right lower lobe where there was a partly consolidated condition. Section shows pneumonic areas. Heart and vessels; heart weighs 250 grams. Valves and myocardium normal. Aorta normal. Liver, weight, approximately 1200 grams. Liver tissue is slightly pale in color but otherwise normal. Gall bladder, normal. Pancreas; weight, 75 grams. Normal. Spleen; weight, 90 grams. Pulp cream-red in color. Kidneys; combined weight 250 grams. Cortex and medulla easily distinguished from one another. The parenchyma congested and blue-red in color. The capsules strip normally. Subcapsular cortical tissue injected. Stomach and intestines hyperemic, but in other respects normal. Uterus; endometrium smooth and of a pink-red color. The wall of the fundus partly (about half) repaired; the peritoneal surface below normal. Head; scalp covered with serum, due to a wet and boggy skin. The surface of the calvarium is wet and slippery (serous). Beneath the dura mater a thick purulent exudate covered the superior surfaces of the right and left hemispheres. Section into the brain substance showed the lateral ventricles contain a small quantity of slightly reddened fluid. The cortical and subcortical brain tissue presented petechial hemorrhages. In the right cerebral hemisphere was an area 2x3 inches in diameter composed of blood clot bordered by softened brain tissue. The hemorrhage did not communicate with the ventricles of the brain. The meninges of the base of the

brain were not involved. Bacteriologic examination; diplococcus and pneumococcus from cerebral hemisphere. Anatomic diagnosis: Encephalitis. Brain hemorrhage. Basal lobar pneumonia. Parenchymatous nephritis. Postoperative healing wounds of uterus and abdominal wall.

CASE 2.—Malignant disease of the cervix in a young primipara. This case is presented because of its extreme rarity, and its history should be preserved in the records of this Association.

Mrs. H. G., aged twenty-four years, American, white. Father died at forty-seven of heart trouble; mother died at forty-one of cancer of the stomach. Otherwise hereditary history negative. Before puberty patient had scarlet fever, mumps, measles, whooping cough, and chicken pox. At eighteen she suffered an attack of appendicitis, but was not operated upon. Menstruation began in the twelfth year and was always regular, the flow being moderate and without pain. About a year ago she missed one period, believed herself pregnant, and thought she miscarried. No cause was known for the menstrual omission or the abortion, if it was one. There was no instrumentation of any kind. With the exception of June, 1919, she menstruated regularly throughout her pregnancy, each period lasting about four days. She was admitted to the hospital service on January 14, 1920, with a message from her physician that she had placenta previa.

Examination showed the patient to be organically and physiologically normal, except for a foul, grumous, red, vaginal discharge. Pregnant and near term. Vertex presented. Rectal examination revealed a soft spongy mass in the region of the cervix. January 16, after careful preparation, and under gas anesthesia, an ocular examination of the vagina was made and a soft sloughing mass was observed which involved the right side of the cervix and the upper portion of the vagina. The cervix was quite movable and not dilated. A small section of the mass was removed with the sponge forceps, which the pathologist pronounced "highly malignant, rapidly advancing squamous-celled carcinoma."

The membranes ruptured and labor began the morning of January 20. She was immediately taken to the operating room, and a transperitoneal Cesarean section was performed through a low and long incision. A healthy child was delivered. The uterus was quickly closed with temporary sutures. This was immediately followed by a panhysterectomy, removing the upper half of the vagina at the same time. There was a minimum of hemorrhage. No shock followed the procedure. The operation was completed in a little less than thirty minutes. Recovery was prompt and uneventful. A vaginal examination, made on February 4, showed a few small nodules in the vault of the amputated vagina. A more radical operation was suggested, but was declined for the time. She left the hospital February 5, promising to return in a week. This she did not do; but instead she returned April 6, when I found the whole upper part of the vagina involved by the bleeding malignant mass. She was not seen again. Her death was announced August 21. The youth of this patient, and the extreme rapidity with which the malignant growth spread in a patient who had never had an injury to the parts involved, make this case one of great interest.

PSEUDOCHOLECYSTITIS

By Harold D. Meeker, M.D., F.A.C.S., New York, N. Y.

IN RECENT years a few observers have recorded instances of certain bands or adhesions found in the upper abdomen and isolated cases have been reported. The consensus of opinion has been that the etiology must be definitely established and the bands scientifically classified before they will merit serious consideration.

In a study of over four hundred laparotomies in which these bands were present, it was observed that certain types occurred with such a degree of constancy that the following arbitrary anatomic classification suggested itself:

I. Bands Involving the Duodenum.
    1. Hepatoduodenal band.
    2. Cholecystoduodenal band.
    3. Hepatocystoduodenal band.
II. Bands Involving the Stomach.
    1. Hepatogastric band.
    2. Cholecystogastric band.
    3. Hepatocystogastric band.
    4. Duodenogastric band.
III. Bands Involving the Colon.
    1. Hepatocolic band.
    2. Cholecystocolic band.
    3. Hepatocystocolic band.
    4. Gastrocolic band.
IV. Irregular.

Other combinations may exist but none have been reported by others or observed by the writer.

ETIOLOGY

In the limited literature on this subject three theories have been advanced in an effort to explain the presence of these bands. One is that they are the remains of embryonal structures; another, that they are the result of evolutionary development; the third theory considers them the result of a toxic process. In the opinion of the writer all three factors may enter into their formation. In well nourished individuals with strictly localized symptoms, without signs of toxemia, and without any history of a previous inflammation or operation, the bands are believed to be of embryonal origin, the structure of which has gradually become altered so that a point is eventually reached when they interfere with the normal functioning of the involved organs. In these cases there is no apparent need for additional

supports of the involved organs, which would be the underlying factor of an evolutionary development. Neither is their any evidence of a previous inflammatory condition which has called forth a protective exudate, to become subsequently organized and involve approximated organs in a reparative process. The bands present in this group then are considered as of embryonal origin, for the reason that their presence does not appear to be explainable in any other way. An evolutionary origin is assumed for cases in which, in addition to the local symptoms, there is a pronounced toxemia associated with a visceroptosis, which always results in more or less interference with the mesenteric circulation with consequent nutritional disturbance and a general lowering of muscle tone. In other words the bands are developed as accessory ligaments in response to the demands of the prolonged downward drag for additional support. Any of the causes of a visceroptosis may thus be responsible for the subsequent development of the bands, which afford a practical demonstration of Nature's attempt to reenforce supporting structures in the line of strain. The irregular bands or adhesions are believed to be the result of a local toxic process or the denudation of peritoneal cells at some previous operation. There is no biomechanical rule, no developmental process by which this irregular fixation of adjacent tissues can be logically explained.

In this series of four hundred cases of bands found in the upper abdomen, the ones which occurred most frequently were those involving the gall bladder, 140, or 35 per cent, being of this type. In view of its relative frequency, this particular group of bands is herewith given detailed consideration.

The title pseudocholecystitis is self-suggestive, inasmuch as these cases almost invariably give rise to certain symptoms which we have been taught to interpret as indicating a cholecystitis. When operation, however, shows no evidence of a previous or present inflammatory process, it is obviously incorrect to classify the condition as cholecystitis. A true cholecystitis and bands involving the gall bladder may coexist, in which case the inflammatory symptoms will mask those caused by the bands.

AGE AND SEX

It was observed that the majority of these bands occurred in women between the ages of thirty-five and forty-five. The youngest case of the series was twenty years and the oldest sixty-five years.

OCCUPATION

Individuals who had undergone hardships in early life, improper or inadequate food, together with prolonged exertion; and those of sedentary habits with an overabundance of food, seemed predisposed to the development of this condition.

HEREDITY

Four instances occurred in which more than one member of the same family was operated upon for similar conditions. Several patients stated that the parents, or other members of the family, had had similar symptoms. If the origin of the bands in a particular case be embryonal, inherited tendencies or characteristics may be a factor; if evolutionary or inflammatory, similar living conditions and habits may be responsible for the development of like bands in the same family.

AVERAGE HISTORY OF TYPICAL CASE

In considering an average history of cases in which a pseudocholecystitis exists, two types should be kept in mind: those complicated by

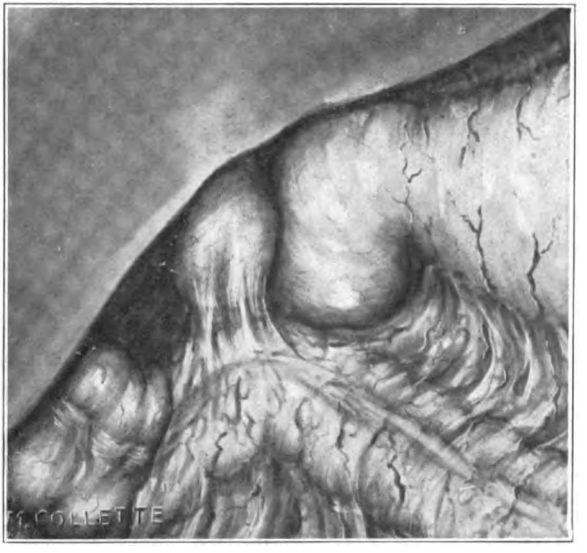

Fig. 1.—Cholecystocolic band showing downward drag on gall bladder, upward pull on colon causing angulation of gut when patient is in the upright position.

bands involving other viscera, and the uncomplicated cases. In this series 80 per cent were complicated by bands involving the terminal ileum, appendix or cecocolon; 10 per cent had either additional involvement of the small gut at the duodenojejunal angle, or of the pelvic colon, or both, or some other fixation band along the course of the gastrointestinal tract. It will be seen that in most cases where bands occur in the upper abdomen, adventitious structures will be found in other parts of the same cavity and should always be looked for.

In the average case of this group the symptoms are those of an intestinal toxemia of varying degree, in addition to local distress in the upper abdomen and, frequently, also at the site of involvement in some other part of the abdominal cavity. When the bands are sufficiently developed

to retard the fecal current, certain bacterial and chemical changes take place within the gut which are responsible for the resulting toxemia. These patients are apt to be poorly nourished, of sallow color and with dry and loose skin. They are always tired, in spite of a large amount of sleep. They are irritable, hypersensitive, and depressed. Obstinate constipation is the rule; but diarrhea, alternating with constipation and a chronic colitis, are frequently met with. Cold extremities, feeble heart sounds, and a low blood pressure are usually present. The local distress, in the instance of gall bladder involvement, is of slow onset, gradually getting worse. The discomfort is most marked after meals and is usually associated with gas in the stomach. An unusual amount of gas in the colon is apt to add to the epigastric discomfort because of the increased drag.

Fig. 2.—Hepatocystocolic band showing downward drag on gall bladder and liver, and fixation of colon.

Many patients have learned that the recumbent position diminishes discomfort and have acquired the habit of lying down for a time after meals. Some are never comfortable except when lying down; others may be relieved by posture but are never entirely free from discomfort. Jaundice may appear when the bands are so situated as to drag on the common duct and thus interfere with the flow of bile. This type of jaundice is remittent and disappears rapidly when a posture is maintained which relaxes the drag, but it promptly reappears when the upright position is resumed. Recurrent, so-called "bilious attacks" with vomiting, are common. Actual pain is rare; when, however, a band is attached well down on the gall bladder, toward or involving the ducts,

sharp pain simulating gallstone colic may occur. Tenderness may always be elicited by making traction on the fixed points of the band.

In the second or uncomplicated cases of pseudocholecystitis, the patients are well nourished, do not show indications of intestinal toxemia and complain only of such local distress in the upper abdomen as has just been cited. The diagnosis of the various types of bands which may cause a pseudocholecystitis, will be considered separately in order of their most frequent occurrence.

1. *Cholecystocolic Band.*—This type occurred in 47 per cent of the 140 cases. The upper limit of the band is usually attached to the fundus of the gall bladder but may extend to the base of the cystic duct. The lower end is attached to the upper border of the transverse

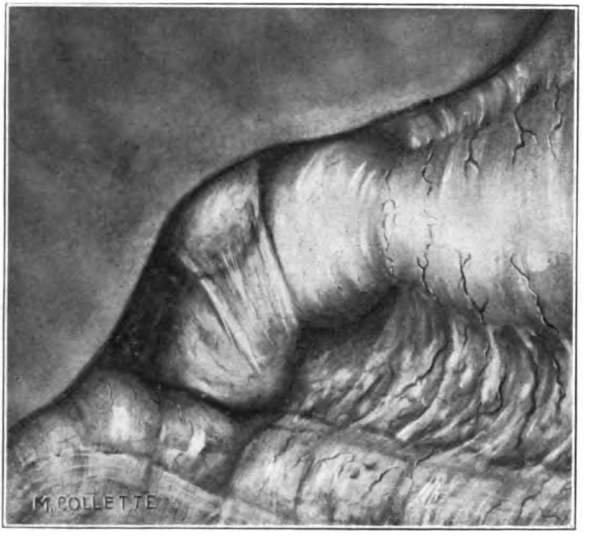

Fig. 3.—Cholecystoduodenal band showing drag on gall bladder and constriction of duodenum.

colon, with prolongations extending to the transverse mesocolon. These bands vary in density, most being rather delicate, fibrous, and do not bleed when divided. The usual subjective symptoms have been alluded to. In the physical examination, direct pressure over the gall bladder gives rise to slight tenderness, deep pressure over the transverse colon just below the gall bladder also gives rise to slight tenderness, but the moment the direct pressure at this point is changed to downward traction, pain is elicited not only under the finger tips but also at a point several inches above the examining fingers. This procedure may cause sharp pain in the back and shoulder. This type of band may cause a degree of duodenal constriction depending upon its structure and point of attachment to the colon.

In patients with an abdominal wall difficult to palpate, the position of the transverse colon may be well defined by passing a soft rubber

catheter into the rectum, attaching a Davidson syringe bulb to the catheter and inflating the bowel with air. The outline of the gut can occasionally be seen, frequently felt and always mapped out by percussion, by this method, and an abnormal fixed point readily determined.

A true cholecystitis may be eliminated by the absence of history or local signs of an inflammatory process.

In differentiating a pseudocholecystitis from gallstones, the following procedure is of value: Place the patient in moderate Trendelenburg posture, with knees flexed to help secure the maximum relaxation of the abdominal wall. If deep palpation over the gall bladder gives rise to pain or tenderness, which is increased by pressure upwards

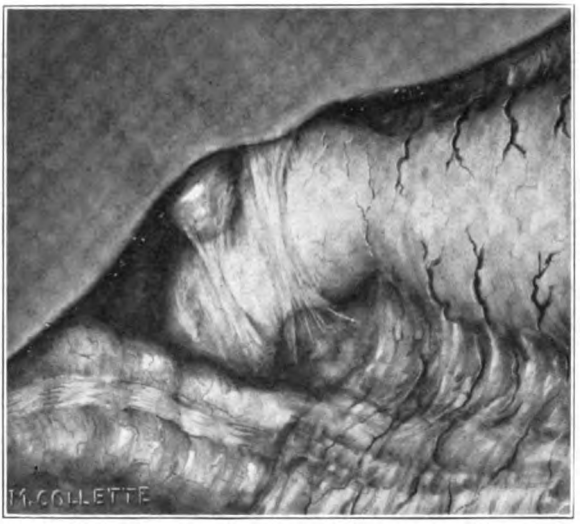

Fig. 4.—Hepatocystoduodenal band showing drag on gall bladder and liver, and constriction and fixation of duodenum.

under the liver, gallstones are probably present. If upward pressure relieves or does not increase the discomfort, and downward traction aggravates it, a cholecystocolic band probably exists. If pain is caused under the examining fingers by pressing the gall bladder up under the liver and pain is also caused by downward traction below the gall bladder but referred to a point above the finger-tips, as well as directly under them, gallstones and a cholecystocolic band probably coexist. An x-ray examination may show gastrointestinal motor insufficiency, duodenal constriction and an angulation of the transverse colon if the plate is made with the patient in the upright position. Such examination, however, is of no great value in determining the presence or absence of a cholecystocolic band. The strain produced by a band of this type is downward on the gall bladder and upward

on the transverse colon. Gall bladders have been observed extending from one to four and a half inches beyond the liver margin, as a result of the prolonged downward drag.

2. *Hepatocystocolic Band.*—This type was present in 18 per cent of the series. In most instances the attachment to the liver is close to the cystic fossa and consequently gives rise to signs and symptoms practically identical with those caused by a cholecystocolic band. It is of no material advantage to differentiate the two.

3. *Cholecystoduodenal Band.*—Sixteen per cent of the involved gall bladders showed bands of this type. This variety may cause duodenal constriction and more rarely a degree of rotation. The amount of resistance to the passage of the duodenal contents determines the degree

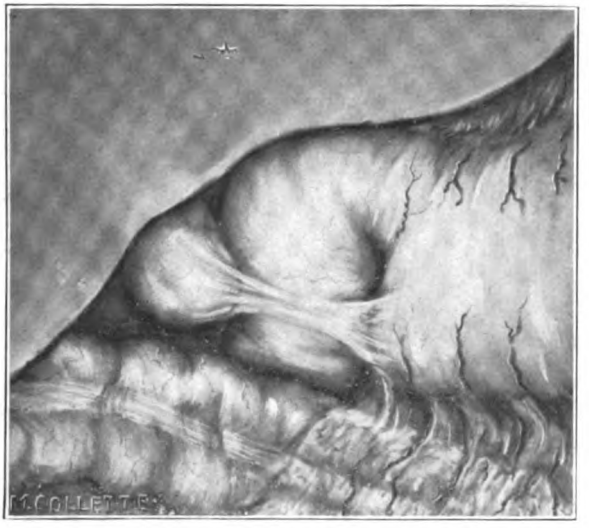

Fig. 5.—Cystogastric band. Gall bladder dragged downward and to left, pyloric end of stomach pulled to the right. Duodenum constricted.

of duodenal dilatation above the point of constriction as well as the gastric dilatation and delay. Patients with this type usually complain of chronic indigestion with marked fermentation. Frequently there is pain in the epigastrium which is relieved or ceases when the patient lies down. An acute inflammatory condition may be eliminated by the history. Tenderness over the gall bladder extending downward and to the left, sharply localized, increased by downward traction, but decreased by upward traction, when present with any or all of the aforementioned subjective symptoms, suggests the presence of this type of band. X-ray examination may show a duodenal dilatation above the band and irregularities in the involved gut which are frequently interpreted as indicating duodenal ulcers. The line of strain is downward and to the left on the gall bladder, and upward and to the right on the duodenum.

4. *Hepatocystoduodenal Band.*—Thirteen per cent of the series had this type of band. The signs and symptoms of the combined type do not differ materially from those of the cholecystoduodenal type and there is no material advantage in differentiating the two.

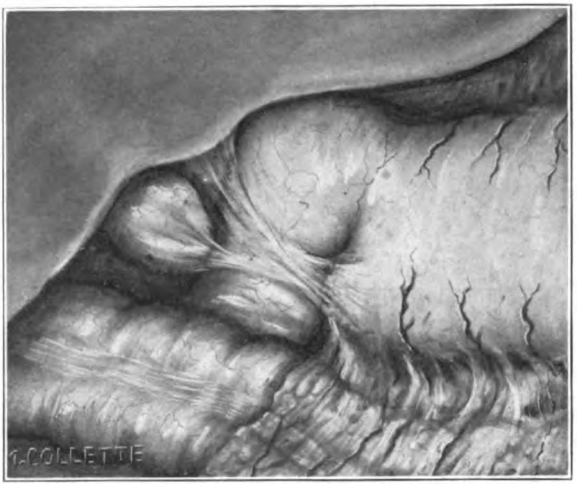

Fig. 6.—Hepatocystogastric band. Same as Fig. 5 with addition of liver drag.

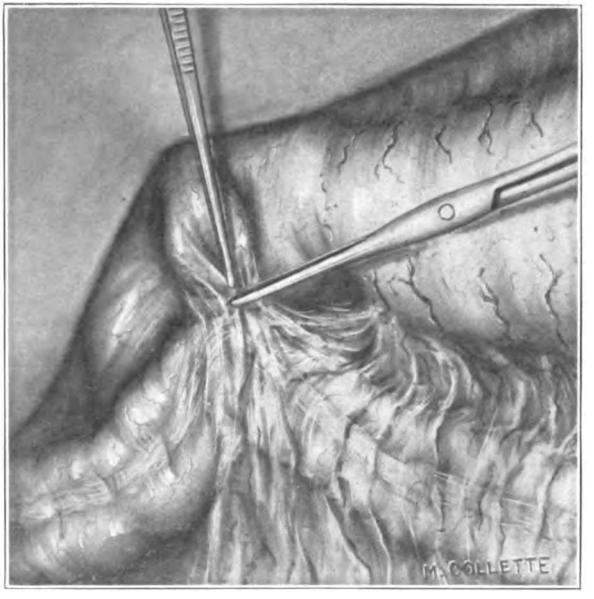

Fig. 7.—Technic of repair. Margin of band lifted from underlying structures and nicked with scissors preparatory to undermining of edges.

5. *The cystogastric band* was present in 3 per cent of the cases. These bands also vary in density. The most frequent point of gastric attachment is on the greater curvature, 4 to 5 cm. from the pylorus. Fibrous

prolongations are often seen attached to the gastrocolic omentum. The strain is downward and to the left on the gall bladder and upward and to the right on the stomach.

SYMPTOMS

There is tenderness at the points of attachment of the band, and there may be constriction of the duodenum between these two points. Patients complain of a varying amount of discomfort in the gall bladder region, gastric fermentation and pain, the severity of which may be influenced by the power of the gastric muscle contraction and the weight of the stomach contents. The discomfort is usually modified or relieved by the recumbent position.

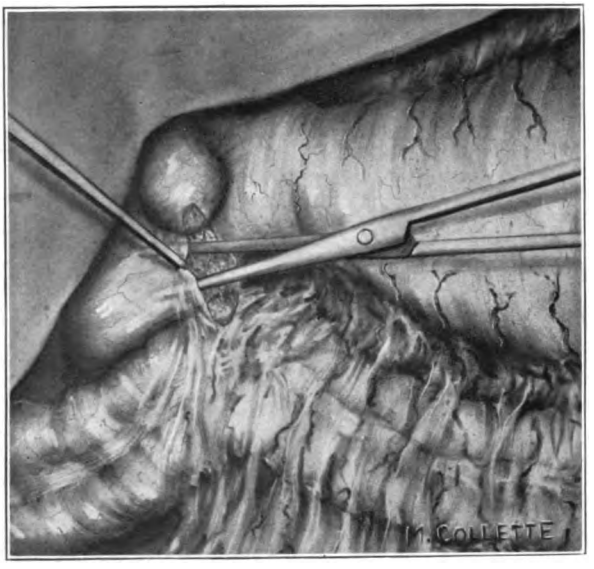

Fig. 8.—Showing method of blunt dissection. After the underlying loose tissues have been pushed aside the edges of band are further divided transversely until all tension and abnormal fixation has disappeared. Surrounding peritoneum is further undermined if necessary, to permit covering of raw surfaces without tension.

DIAGNOSIS

This type of gall bladder involvement may be distinguished from a true cholecystitis by an absence of inflammatory symptoms. Pressure and traction downward and to the left over the pyloric end of the stomach gives rise to pain in the region of the gall bladder as well as directly under the finger-tips. The gastric attachment of the band may be so placed as to cause a water-trap stomach, as seen in the accompanying illustration. These cases are very frequently diagnosticated as gastric ulcer solely on the persistent and sharply localized point of gastric tenderness. X-ray examination may show a duodenal dilatation above the band

and a delayed emptying time of the stomach. Any irregularity detected in the stomach at the site of attachment of the band, is often wrongly interpreted to indicate an ulcer or neoplasm.

6. *The Hepatocystogastric Band* was also found in 3 per cent of the cases. The line of strain in this type is downward and to the left on the liver and gall bladder and upward and to the right on the stomach. The physical signs, symptoms, and x-ray findings are practically identical with those of the cystogastric bands.

Irregular bands adhering to no definite type or combination of types are the result of a preceding inflammatory process, or due to peritoneal irritation at a previous operation.

The signs and symptoms of this group are inconstant, depending upon the structures involved and the degree of involvement. A history of a previous operation or of symptoms indicative of an antedating inflam-

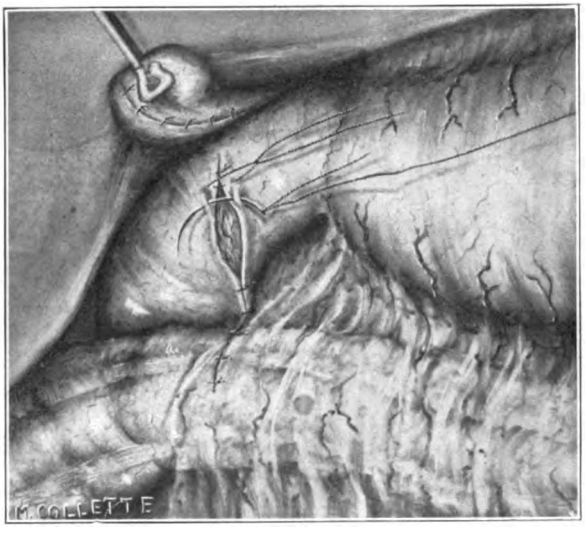

Fig. 9.—Showing method of inserting stitches to cover raw surface and invert raw edges of divided band.

mation in the upper abdomen together with functional disorders of one or more viscera of this region, suggests the presence of the irregular bands or adhesions.

SURGICAL REPAIR

When these bands have developed sufficiently to interfere with normal function of the involved organs, conservative measures are unsatisfactory and operation offers the only permanent relief. The surgical repair consists in the division of abnormal attachments which interfere with normal physiologic processes and the covering of all raw surfaces with peritoneum. This can usually be accomplished by dividing the bands transversely and suturing longitudinally with inversion of the raw edges.

In some instances, especially in the irregular types, omental grafts are used to insure proper covering of raw surfaces. Very fine round needles should be used, threaded with fine oiled linen or the finest catgut.

The technic employed in the surgical repair of an average cholecystocolic band is shown in the accompanying illustrations.

CONCLUSIONS

1. The occurrence of adventitious bands in the upper abdomen has been established beyond question.

2. These bands give rise to definite symptoms.

3. The gall bladder is the viscus most frequently involved, the resulting symptoms simulate a cholecystitis.

4. Plastic surgery has given definite relief. As complete freedom from symptoms has been recorded ten years after operation, it is reasonable to suppose relief may be permanent.

5. It is illogical and unfair to patients to withhold a chance of relief because the origin of these bands may not yet have been definitely established.

6. The frequency with which adventitious bands in other parts of the abdomen coexist with those of the upper abdomen, emphasizes the importance of a thorough search of the entire gastrointestinal tract for abnormal bands and fixed points.

7. It is to be hoped that a comprehensive discussion of these bands will be found in the surgical text books of the near future. A knowledge of the condition will be the means of restoring to a life of comfort many individuals otherwise condemned to continued suffering.

DISCUSSION

DR. ROBERT T. MORRIS, NEW YORK CITY.—In 1893 Mr. Lane published a description of his "kink," and I published in the same year a description of what I called "cobwebs in the attic of the abdomen." We both at that time ascribed these to toxic causes. Mr. Lane captured the ear of the profession earlier than I did in presenting his subject, because so many men were at work to find his "kink," and I found it incidentally.

In the great majority of cases there are some adventitious bands that seem unquestionable, but in a large proportion, so far as my observation goes, the cases are toxic in their origin and are due to an elective affinity, I believe, according to Rosenow's theory of toxins. The destruction of tissue, the injury of tissue, is not done so much by enzymes or by bacteria at this point as by antibodies which are called out in response to the presence of toxins brought there by elective affinity. The overaction of the antibodies causes autolysis, loss of plastic exudate, and replacement of plastic exudate with connective tissue. It seems to me, we may look upon the toxic feature as fundamental in most of these cases, and I believe they will respond to treatment aimed at some fundamental focus of infection.

In regard to the treatment, I have followed very closely the method employed by Dr. Meeker, but in some cases, where the raw surface is very large, I have not employed the graft or buried the raw surface, but have used the cargile membrane, or sometimes the aristol film. A good resource is to allow the patient to turn often

in bed from one side to the other, shortly after operation. Instruct her to turn once or twice a day, sitting up and lying down in such a way that new plastic exudate after operation is not replaced by connective tissue until endothelium grows across the raw surfaces.

DR. GORDON K. DICKINSON, JERSEY CITY, NEW JERSEY.—Dr. Morris' ideas as to the bands and his operation appeal to me, but from the cases I have seen and studied, I am not convinced they are correct. Abdominal surgeons run across them frequently and find them to be embryonal in character. They are really overgrowths of the greater omentum. They may occur up under the liver or gall bladder, may run up on the hilus or down into the abdominal wall.

DR. WILLIAM SEAMAN BAINBRIDGE, NEW YORK CITY.—Although many of us are interested in and devoting a good deal of time to the study of the causation of these bands, others are curing cases that otherwise would go on suffering for years. Twenty years ago, when we began to talk about kinks, bands, etc., we were laughed at, and were told that there were no such things. Gradually, the profession has come to recognize the existence of these abnormal conditions, and Dr. Meeker has gone a long way towards classifying and bringing them into anatomic relationships. If these bands are present and if they are doing harm, then they should be treated as entities. For fifteen years some of us have been publishing our cases of stasis. As a rule, the results have been most gratifying. We cut transversely and sew up longitudinally, relieve stasis bands and angulation, and thus improve or cure these patients.

I believe it is time for us to realize the importance of these bands and not to ignore their existence, or wait to find their cause before instituting corrective measures based upon mechanical principles.

When we take out the chronic appendix, let us remember the relationship of the right upper to the right lower quadrant, and the possibility of bands elsewhere in the abdomen. A pull on the transverse colon will often demonstrate the presence of such bands as shown by Dr. Meeker. Often the patient must be placed in the anatomic position to discover the bands of attachment of the dependent organs, to the points of fixation above.

DOUBLE FLAP LOW CESAREAN SECTION RESULTS

By Thurston Scott Welton, M.D., F.A.C.S., Brooklyn, N. Y.

FROM November, 1919, to August, 1920, the author performed the double flap low Cesarean section eleven times. Seven of the eleven patients were potentially infected at the time of operation. With many operators the indications would have justified them to sacrifice the life of the child, and perform craniotomy instead of opening the abdomen.

Although the majority of these women were potentially infected at the time of operation and, although six of the number were infected, according to the temperature charts following the sections, not a single case of peritonitis occurred and the maternal mortality was *nil.*

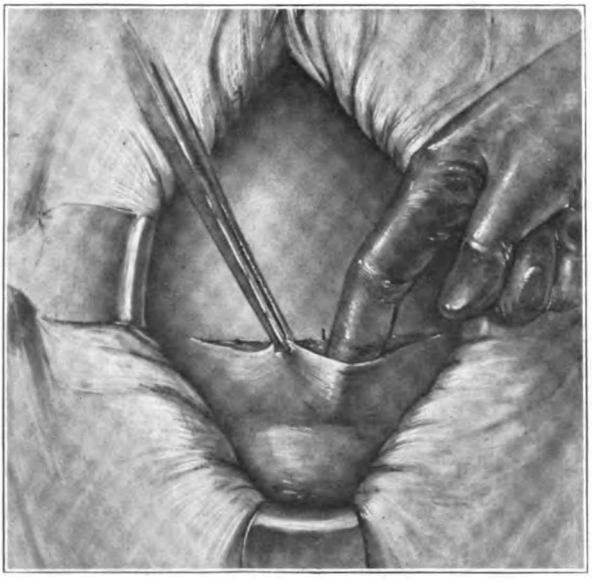

Fig. 1.—Loose peritoneum in region of bladder cut transversely making the lower or inferior peritoneal flap.

It was my privilege to observe Drs. J. O. Polak and A. C. Beck, working at the Long Island College Hospital, operate upon a large number of patients according to the special technic referred to. Their results were so impressive that I began to do this type of operation in cases where Cesarean section was the indication of choice.

Beck described an operation in an article entitled "Observations on a Series of Cases of Cesarean Section Done at the Long Island College

Hospital During the Past Six Years." (American Journal of Obstetrics, Vol. lxxxix, No. 2, 1919), of which the essential features include a low abdominal incision, stripping the bladder with its peritoneal covering from the lower segment of the uterus, dissecting away the peritoneum from the uterus above the bladder incision, incising the uterus in this exposed area, delivering the child, closure of wound in uterus and overlapping the peritoneal flaps so as to seal the uterine wound.

In all my Cesarean cases I have employed the transverse incision of the abdomen just above the pubes. To date the results have been satisfactory. All have healed by primary union. We have observed no hernia

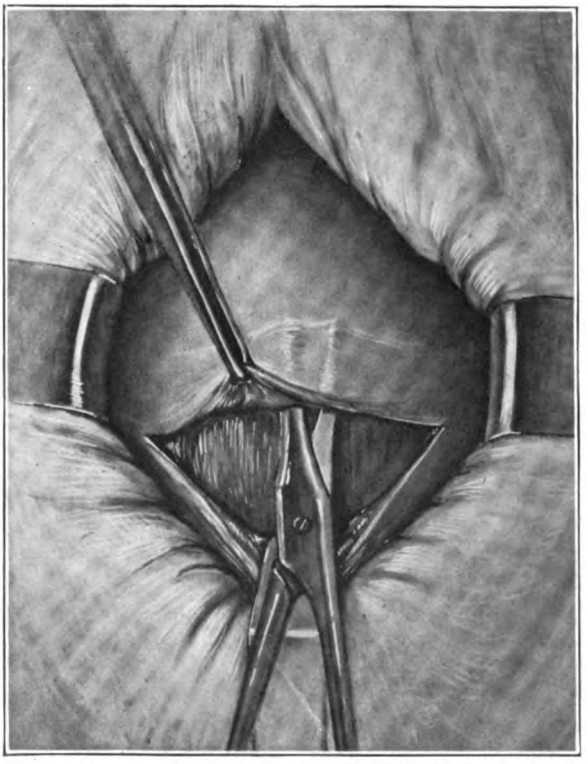

Fig. 2.—Upper or superior peritoneal flap made by dissection with blunt-pointed scissors.

upon discharge from the hospital. I have placed the traction-sutures, one in the lower and one in the upper angle of the uterine incision, prior to opening the uterus. An assistant holds these sutures taut thus facilitating the placing of the first row of deep sutures.

The postoperative treatment consists in a low Fowler position of the bed, an ice-cap to the fundus of the uterus, which is possible only in this type of section as the fundus is above the abdominal dressings, and a dose of pituitrin or ergot. Because of the low situation of the dressings, the fundus of the uterus may be held by a nurse or an assist-

ant to prevent postpartum hemorrhage the same as after a spontaneous delivery.

CASE REPORTS*

CASE 1.—No. 12626. Primipara. In labor three days. Membranes ruptured two days. Family physician made from four to six examinations a day through an unclean vulva. Physician wore no gloves and washed his hands after rather than before the vaginal manipulation. Patient potentially infected at time of operation. Temperature was 100.3°F. on third and fourth day after the operation, and 99.4°F. on fifth day. Infection doubtful. Dismissed from hospital without pelvic pathology.

CASE 2.—No. 12842. Primipara. In labor 32 hours. Membranes ruptured seven hours. No vaginal examinations had been made. Not classified as potentially infected. Patient ran an uneven temperature, 100°F. to 101°F., for seven days which reached the normal the ninth day. Dismissed from hospital with negative findings.

CASE 3.—No. 12877. Primipara. In labor twenty-four hours. Membranes ruptured about ten hours. Three vaginal examinations through prepared field. Potential infection prior to operation doubtful. On fifth day temperature reached 100.2°F. Normal temperature on the sixth day and thereafter. Actual infection doubtful. Negative pelvis on dismissal.

CASE 4.—No. 12950. Para III. Ambulance case. In labor thirty-two hours. Membranes ruptured over twenty-four hours. Family physician had examined her "many times" through an unprepared vulva. Had had a previous Cesarean section. Potentially infected at time of operation. Temperature and pulse chart shows actual postoperative infection. Ran an uneven temperature for nine days. On three occasions temperature reached 101°F. with pulse 120. Negative findings upon dismissal from hospital.

CASE 5.—No. 14701. Primipara. Seen by author in consultation. In labor sixteen hours. Membranes ruptured nine hours. Two vaginal examinations through prepared field. Physician wore sterile gloves. Patient was not considered potentially infected at time of the operation. Ran an uneven temperature, between 99° F. and 101°F. for ten days. Diagnosis of infection after operation. Findings were negative upon dismissal from hospital.

CASE 6.—No. 14158. Primipara, forty-two years old. In labor thirty-six hours. Membranes ruptured ten hours. Two vaginal examinations through prepared vulva. Physician wore sterile gloves. Not considered infected at time of operation. On sixth day temperature suddenly reached 100.3°F. and as suddenly returned to normal. No postoperative infection. Negative pelvis upon leaving hospital.

CASE 7.—No. 17138. Primipara. Not in labor. Membranes not ruptured. Many vaginal examinations and attempts at induction of labor by family physician. Ran uneven postoperative temperature, ranging between 100°F. and 103° F. for first eleven days. On the twelfth day temperature reached 104°F., pulse 124. Temperature fell to normal on fourteenth day and after that varied from normal to 99.3°F. until time of dismissal from hospital. Final examination revealed a parametritis.

CASE 8.—No. 17598. Primipara. Patient in labor forty-two hours. Membranes ruptured twenty-four hours. Many vaginal examinations through an unprepared field. Patient potentially infected at time of operation. Uninteresting chart until sixth day, when temperature went to 101.3°F. On eighth day temperature 103°F., and on ninth day 104° F. Uneven temperature until thirteenth day after the operation, when it reached the normal. Patient insisted upon going home on 17th day. Family phy-

*Cases 1, 2, 3, 4, 5, 6, 10, and 11 are from the Greenpoint Hospital; Cases 7 and 8, from the Williams Hospital; and Case 9, from Long Island College Hospital.

sician instructed regarding treatment. Last report six months later, patient still had symptoms of chronic pelvic infection.

CASE 9.—No. 902. Primipara. Aged forty-two years. In labor twenty-four hours. Membranes ruptured twenty hours. Many vaginal examinations through an unclean vulva. Patient potentially infected at time of operation. Between fourth and tenth days after the operation she ran an uneven temperature between 100°F. and 101.4°F. On dismissal tenderness on both sides of lower abdomen, thickening of

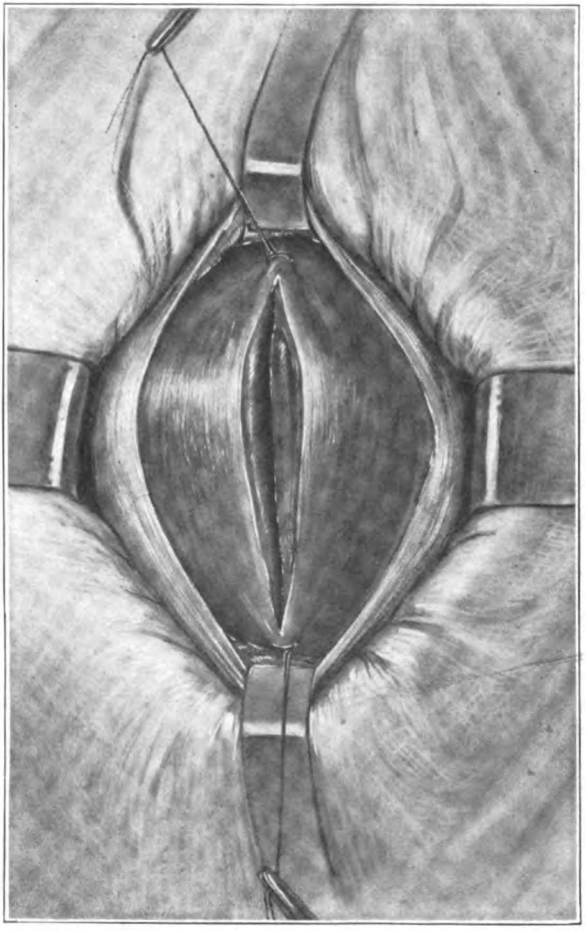

Fig. 3.—Upper and lower peritoneal flaps retracted. Traction sutures inserted in lower and upper angles of site of incision. Incision of uterus between traction sutures.

the bases of both broad ligaments, and tenderness in the uterosacral ligaments. During the third week postpartum, patient developed a phlegmasia alba dolens.

CASE 10.—No. 14518. Multipara. Ambulance case. Not in labor. Membranes intact. Many vaginal examinations by a midwife, later by a physician, through an unclean vulva. Patient potentially infected at time of operation. Temperature reached 99°F. on third day after operation, and continued so until patient left hospital.

CASE 11.—No. 14612. Multipara. Ambulance case. In labor about seventy hours.

Membranes ruptured about fifty hours. Pains severe. Many vaginal examinations through an unprepared field by midwife and physician. Patient potentially infected at time of operation. Temperature normal third day after operation. On night of sixth day temperature 101°F., but it was normal the next morning and remained so until patient left the hospital.

Although seven cases were potentially infected at the time of operation, and six cases showed infection after operation, the uterine wound was so effectually sealed that there was no leak into the general peritoneal cavity and no peritonitis developed. All the mothers lived. Three cases had a distinct pelvic pathology upon dismissal from the hospital.

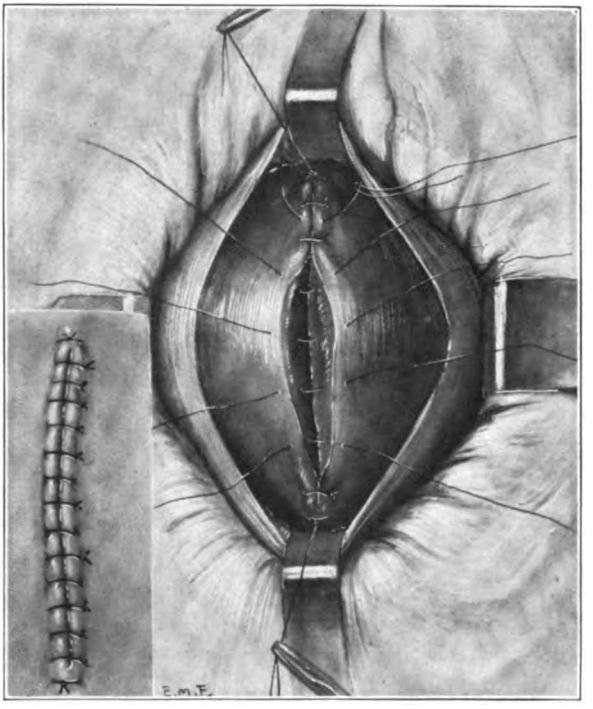

Fig. 4.—Deep layer of interrupted sutures placed. (Placenta and membranes delivered.) Superficial layer of interrupted sutures placed. The placing of these sutures is facilitated by traction made by an assistant. Insert shows uterine wound closed. Sutures tied.

We may sum up these eleven cases as follows:

Duration of labor before operation: not in labor, two; in labor 3 to 10 hours, none; in labor 10 to 24 hours, three; in labor 24 to 36 hours, three; in labor 36 to 48 hours, one; in labor more than 48 hours, two; in labor more than 24 hours, six.

Condition of the membrane: not ruptured, two; ruptured less than 10 hours, two; ruptured 10 to 24 hours, four; ruptured 24 to 36 hours, one; ruptured 36 to 48 hours, two; ruptured more than 48 hours, none; ruptured more than 10 hours, seven.

Vaginal examinations: no vaginal examinations, one; two vaginal ex-

aminations, two; three vaginal examinations, one; many vaginal examinations, seven; two or more vaginal examinations, ten; examinations through an unclean vulva, eight.

Cases which from the duration of the labor, length of time the membranes were ruptured, and the number of vaginal examinations through an unclean vulva were regarded as potentially infected, seven. Of this number those actually infected, as shown by temperature and pulse, six.

Inasmuch as eleven case reports are insufficient from which to draw

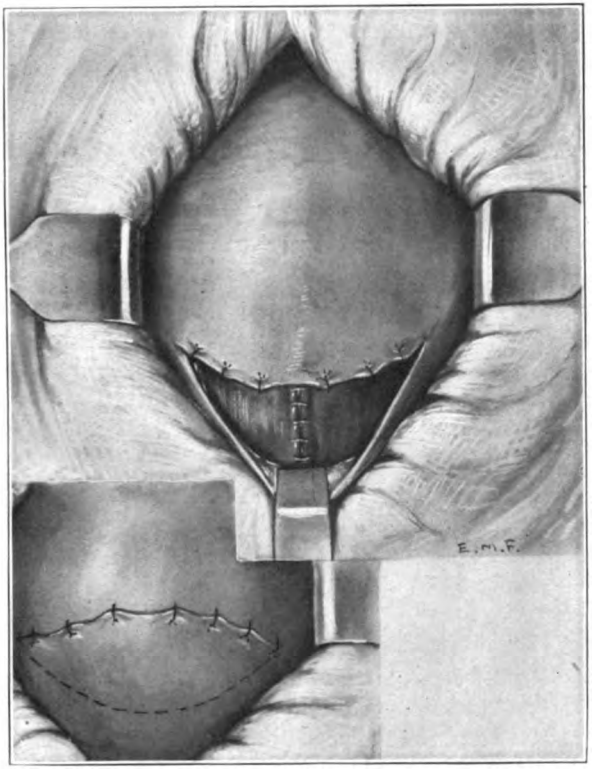

Fig. 5.—Upper picture. The upper or superior flap is anchored by from 4 to 6 interrupted plain catgut sutures. These sutures must not come in contact with the perpendicular uterine wound.

Lower picture. Dotted line shows upper or superior flap anchored. The lower flap of bladder reflection is brought to a point just above the upper angle of the uterine wound and anchored by interrupted plain catgut sutures. A continuous suture may be employed, care being taken not to come in contact with the perpendicular uterine wound. The uterine incision is completely sealed by the peritoneal flaps.

definite conclusions, it is my privilege to add the end results of the cases operated upon by Drs. John Osborn Polak and Alfred C. Beck, from January, 1919, to August 1, 1920, at the Long Island College Hospital. In these nineteen months Polak and Beck performed separately, forty-two double flap low Cesarean sections. Many of these cases were brought to the hospital after having been subjected to much vaginal manipulation by physicians and midwives. In no one instance was the

vulva prepared, neither did the examiner wear sterile gloves. Notwithstanding these facts, in this series of forty-two consecutive cases not a single case of peritonitis developed; and none of the mothers died.

Their chart records, as well as my own, show that the double flaps completely peritonealize the uterine wound. As a result adhesions and postoperative disturbances are greatly minimized. As a result of the findings on this series of a total of 53 cases I have concluded as follows:

1. The double flap and low incision Cesarean section offers great protection against extension of infection to the peritoneum from an infected uterus.

2. For this reason this should be the operation of choice in all potentially infected cases.

3. For the same reason the field for Cesarean section should be extended to such cases as have been long in labor, with the membranes ruptured, and the presence of a potential infection from frequent vaginal manipulation; cases in which most operators would perform a craniotomy on a living child rather than do a Cesarean section.

4. The double flaps so completely peritonealize the uterine wound that adhesions and postoperative disturbances are greatly minimized.

5. Because of the results obtained and the reasons given, the two flap low Cesarean section should be the operation of choice even in elective cases.

DISCUSSION

DR. JAMES K. QUIGLEY, ROCHESTER, NEW YORK.—I should like to ask Dr. Welton to describe his technic in delivering the placenta and the way it was done. I understand it was through the vagina.

DR. WELTON.—No. I said it might be pushed through the cervix, but usually we delivered it through the wound.

DR. QUIGLEY.—If infection comes from infecting the liquor amnii, what is the rationale of protection in these cases?

DR. PAUL TITUS, PITTSBURGH, PENNSYLVANIA.—I think Dr. Welton brought out an important point when he referred to the condition which he termed potential infection. It requires comparatively little manipulation to place a case in the category of "potentially infected," and the ordinary classical Cesarean section then becomes a hazardous matter for a patient where it might have been of little or no risk to her had she been let alone. Mortality, or at least morbidity, increases in direct ratio to the length of time a patient has been in labor before a classical Cesarean section is decided upon, and the rupture of the membranes definitely increases the mortality of this operation. In other words classical Cesarean section should be done only under ideal circumstances in order to obtain good results.

Some type of extraperitoneal Cesarean section can be substituted in cases which are possibly infected, whereas the Porro operation can still be done in those which are probably or definitely infected. The operation which Dr. Welton has described seems to be a modification of the Kroenig-Gellhorn method of performing extraperitoneal Cesarean, the term extraperitoneal meaning, of course, that the point of incision into the uterus is made extraperitoneal before the uterus is actually opened.

For about seven years I have been using Frank's original method which incises both the parietal and the uterine peritoneum and then by suture unites the parietal leaf to the uterine, thus making a peritoneal fistula down to the surface of the uterus. This operation I applied to some twenty or more cases which were, as Dr. Welton has termed it, potentially infected. Some of them, indeed, were so doubtful that rather a risk was taken in employing even this operation. It proved uniformly satisfactory, however, and I have had the opportunity subsequently to perform classical Cesarean section on four of these women. The abdominal cavity was free from adhesions even in those women who had been drained through the original wound and the general results in the abdomen were far better than after the average classical operation. For all other cases I employed the classical Cesarean up to about eighteen months ago.

About that time DeLee of Chicago read a paper before the American Medical Association here at Atlantic City in which he definitely preferred the Kroenig-Gellhorn type of lower uterine segment incision to the classical Cesarean. At the time I was quite skeptical of the advantages which he outlined for this operation, but shortly after we had some disturbing results with some cases in my clinic which were allowed to go some time in labor, of course without vaginal examinations. These patients all had borderline contraction of the pelvis and it was hoped that they might be able to deliver themselves. Classical Cesarean section was done on them because they were supposedly clean cases, but one after another developed elevations of temperature that were very disconcerting, to say the least. In consequence of that I began doing the Kroenig-Gellhorn type of operation, which is quite similar to the one the essayist has described, except that by turning down a triangular flap the suture line in the uterus does not cross under the suture line in the peritoneum. At first this was used only in case a test of labor had been given, but the general advantages and benefits which Dr. Welton has outlined have been experienced so uniformly in my patients that I am thoroughly converted to the idea that this type of operation is superior in every way to the old classical Cesarean section.

DR. ROSS McPHERSON, NEW YORK CITY.—There has been a little query in my mind as to the peritoneal spill. I can see that in this operation the spill, of course, takes place in the lower part of the abdomen whereas in the classical operation the spill is all over the abdomen, which may account for the general peritonitis instead of a local one in this new operation, but for the seriously infected cases I have been doing the real extraperitoneal operation for some time. I do not use the Hirst operation for the simple reason that if you could open a woman's abdomen and suture the uterine peritoneum to the abdominal peritoneum and leave it for twenty-four hours it would be all right but I do not see any reason why bacteria should not come through suture holes into the abdominal cavity. If an extraperitoneal operation is indicated, why not do true extraperitoneal procedure? We have done a good many of them at the Lying-In Hospital in New York City with perhaps not as good results as Dr. Welton and Dr. Polak have had in their cases but infinitely better than a craniotomy on a living child or a dead mother as the result of the classical operation.

DR. E. GUSTAV ZINKE, CINCINNATI, OHIO.—When Saenger, of Leipsic, formulated the modern classical Cesarean section, we thought the *ultima Thule* had been reached; but it seems not. However, what he said at the time remains true still; namely, that the success of the operation depends upon the perfect union of the uterine wound.

I can see no particular advantage in the operation presented. If there is a real infection and the uterus is left behind, this operation does not prevent a spread of the infection. All depends upon the nature of the infection. If you have merely the

saprophytic infection, your patient, in all probability, will recover if the proper precautions and after-treatment are applied. If you have a streptococcic infection, no operation will prevent extension of the infection. It is an operation which, in some instances, may do good; but all will depend upon the nature of infection in the case.

DR. WILLIAM M. BROWN, ROCHESTER, NEW YORK.—I have not yet convinced myself that there was any need for the low Cesarean section. I cannot see why we should have an amniotic spill. You can prevent soiling of the peritoneum just as well in doing Cesarean section through a small incision above the umbilicus as you can by a low incision, and I believe the peritoneum will take care of the ordinary infection, so far as amniotic spill is concerned. I do not worry about that at all. I keep the peritoneum; I do not traumatize it by mopping. It has been a long time since I have had a death from Cesarean section. It has been my custom to clamp the uterine incision right to the abdominal wall, and very often I never see any contents of the peritoneal cavity excepting the uterus, and I do not have any amniotic spill or any soiling of the peritoneum. It seems to me, when you take the added time and added difficulties and added traumatism in the lower uterine segment in peeling off the peritoneum intact, where the infection is down in the lower part of the uterus or in the cervix, you are traumatizing an area where infection is going to spread, and if you get an abscess in the vesicouterine space, you will have more trouble than anywhere else; I would take my chances even with a virulent infection by doing a high classical Cesarean section.

DR. JOHN O. POLAK, BROOKLYN, N. Y.—In defense of this procedure I wish to call attention to two or three points. In the first place, I do not think any of us believe that we get infection from the amniotic spill. The infection comes in a different manner. From a study of our autopsy findings, and we have had autopsies upon a number of classical Cesarean sections who have died of peritonitis, we get the same picture we get in a suppurating wound of the abdominal wall. Along the course of the stitch hole we get infection from the endometrium out. We do not believe that those patients that actually have infection of the lymphatics going into the blood, will live with this procedure. We do believe, however, that those cases that would have ordinarily died of peritonitis by the transit of bacteria from the endometrium to the peritoneum along the suture line, will survive with this technic, for instead of a peritonitis we confine our infection to the parametrium. We have had several abscesses from the lower segment and they were extraperitoneal. Two of them discharged through the wound in the uterus. Early rupture of the membranes exposed the woman to definite infection of the endometrium; that is, the endothelial lining or covering of the amnion cells is changed and the resistance of the woman is diminished. We have found by pathologic study that there is a deciduitis in these cases in the placenta. I have seen these patients recover after one rise of temperature between the first and sixth day.

With regard to the Frank operation, we did that prior to adopting Beck's procedure, and the objection we had to it was that it took more time, and we frequently opened into the peritoneal cavity by accident.

One other point in regard to the placenta. In those cases in which there has been definite evidence of infection, we have been in the habit of pushing the placenta right through the vagina out instead of drawing it through the wound. We have been thoroughly impressed by the fact that technically this operation is not difficult. The wound is low down, and we believe from the limited experience we have had, it is not as liable to cause subsequent rupture as the higher wound. That is the simple claim we make at the present time. We have had three of these women come back and go through labor again. We hope to have all of them if we can.

DR. WELTON (closing the discussion).—Dr. Polak has very kindly answered most of the questions asked by Dr. Quigley, Dr. Brown, and Dr. Zinke, and I will only speak of one point that Dr. Titus brought up regarding his operation and the operation we do.

The shorter duration of the operation, the ease of exposure, the very few technical difficulties and less troublesome delivery of the child are points apparently in favor of the classical section, and may be regarded by some as disadvantages of the technic we have described. These disadvantages, however, scarcely warrant consideration if further experience with our procedure continues to show as it has shown in the past that it offers better protection against hemorrhage, peritonitis, and adhesions, and is followed by an easier convalescence and less risk of uterine rupture during a subsequent pregnancy.

VERSION

By Irving W. Potter, M.D., F.A.C.S., Buffalo, N. Y.

IN ADDRESSING you upon the subject of version this evening, I assume that I am speaking to men who have been specially trained and are experienced obstetricians, and, therefore, if I am bold enough to criticise present day teaching, it is because I have found nothing that would assuage and alleviate the pains and the agonies of the second stage of labor which, to my mind, is the desired aim of modern midwifery. The abdominal surgeon taught us that it was safe and practically without mortality to invade the peritoneal cavity and uterus from above, and thus he led the way for our modern Cesarean section which has resulted in the saving of many lives. I propose to demonstrate to you that it is equally possible and infinitely less hazardous to invade the uterine cavity from below and bring about the safe delivery of the baby without pain and suffering, or undue injury to mother and child.

I shall not attempt to give you the indications for a version, but rather confine my remarks to my method of performing version and the results to mother and child by reason of the operation. Of course, it is self-evident to you all that my range of usefulness and my field for its indications have become so broad, by reason of experience and much practice, that I use it, in normal conditions, simply to relieve women of the pain and suffering of ordinary childbirth by shortening the time of labor and that fact is demonstrated when I say that I personally delivered last year 1113 women, of which 920 were delivered by version 400 being primiparæ and 520 multiparæ.

I have thought it best to describe as briefly and as fully as I can, my method of podalic version. The patient is prepared as for any major operation, shaved, scrubbed and made as clean as possible. The operator is similarly treated and then gowned, with short sleeves and long gloves reaching to the elbow.

The woman is placed upon the table and anesthetized to the stage of surgical anesthesia, then there is no resistance to the various procedures to be carried out. She is then placed in a modified Walcher position, one leg held by an assistant standing on each side, or if no assistants are available, the legs are supported on two chairs while the operator stands between them.

The bladder is emptied of all its urine, and this is very important, as many patients void and still retain a half pint and more of urine in the bladder.

Fig. 1.—Beginning to "iron out" the birth canal with one finger.

Fig. 2.—"Ironing out" process continued with two and three fingers.

Fig. 3.—Showing finally, the whole hand introduced into the vagina.

Fig. 4.—Hand and arm introduced into vagina with towel around operator's arm to protect him from escaping fluid.

The vagina and soft parts are now dilated by first putting in one finger of the gloved hand, well lubricated with green soap, and passing it up as high as the cervix and then withdrawing it with a steady, continuous and firm pressure. Then two fingers are inserted and then three fingers, and finally the closed fist until all the rugæ and folds of the vagina are thoroughly ironed out. It matters not whether the case be a primipara or a multipara, the procedure can be just as satisfactorily and completely done.

Now the cervix, which must always be obliterated or soft and easily dilatable before version is ever attempted, is gently stretched with the fingers. Then the outstretched hand and the arm is pushed high up between the uterine wall and the membranes, and the latter are gently separated all over by sweeping the fingers of the hand up and down and around, being careful not to work too near the placenta.

Next a towel is rolled around the wrist to catch any of the amniotic fluid which might gush out when the membranes are ruptured high up. The hand is now free in the uterine cavity, the position of the child is made out and its probable size estimated, the position of the cord ascertained and the diameters of the pelvis approximated.

Both feet are now grasped between the first and middle fingers of the left hand—the left hand is always used for the version no matter what position the child is in. According to the position of the child, the toes of the feet will either look to the palm of the hand of the operator or away from it.

Now the extraction begins and both feet are brought down to the vulva and delivered together, the child's body having rotated with this onward movement.

Slight pressure is sometimes necessary at this stage to lift the head out of either iliac fossa with the right hand. Continued gentle traction is made until the knees are exposed, at which time the version is complete. Now rest for a few moments and then gently pull upon the anterior foot and lower leg until the pelvis of the child comes into view, when it will be seen that the pelvis rotates in the opposite direction and is eventually delivered in that direction. This rotation is brought about by the traction on the lower leg and the baby comes into the world with its back transverse to the pelvic outlet. No attention is paid to the cord at this time if it is free and loose, which it usually is, but if it is tight and short a clamp is placed at the umbilicus and the cord is cut, if it can't be otherwise loosened.

We now proceed with the delivery of the scapulæ which must be always thoroughly exposed and well out in view before any attempt is made to deliver the shoulder. Then the fingers and the hand of the operator are pushed well above the shoulder between the lips of the

Fig. 5.- Both feet brought outside of vagina. Note method of grasping feet by operator.

Fig. 6.—Version completed. Knees exposed.

Fig. 7.—Buttocks of child being delivered by expulsive efforts of mother.

Fig. 8.—Back of child rotated squarely across outlet.

vulva and the anterior shoulder is delivered with the upper arm. The operator now grasps the baby with his hand over the exposed shoulder and chest and rotates the child's body so that the posterior arm comes anterior and is delivered as such. Both shoulders being now delivered, the lower arms usually fall out of themselves. If, however, they remain undelivered they can be gently lifted up across the chest of the child and drawn away from the perineum under the pubic arch. (You will observe that the baby in this rotation movement is not twisted from the legs as I have seen it done.) The older method of version brought the arm down as a posterior arm across the distended perineum, which was often the cause of the extensive tears consequent upon that method of podalic extraction.

The operator now determines whether there is any loop of the cord around the neck and finding none he proceeds with the delivery, but if the cord be twisted once or twice or even three times around the neck this condition of the cord must, if possible, be relieved, by loosening it, and if absolutely necessary, it must be cut and clamped. However, usually the cord is free and no haste is called for.

The fingers of the left hand are now inserted into the baby's mouth and with the right hand gentle pressure is made upon the occiput over the pubes to aid in the flexion of the baby's head and also to direct its passage through the pelvic canal. The jaw is not pulled upon, as a fracture might result.

Up to this point no pressure from the outside has been made in the delivery, because such pressure over the head before delivery of the arms, has a tendency to push the head down, which allows the arms to go up as well as extend the chin, complications, which at all times must be avoided, and I am sure it is this pressure that makes the difficulties and dangers of other methods of version.

By this time the baby's mouth is exposed and the mucus is milked out of the throat by the fingers gently stripping the front of the neck, when the baby will begin to breathe and often cry aloud.

The head can be left in this position long enough to thoroughly dilate the perineum and vaginal structures, as no haste is indicated and finally the nose is delivered, followed by the brow in an extremely flexed condition which is further assisted by lifting the body well forward and up from the perineum.

The baby is now placed upon its right side on its mother's abdomen and allowed to remain there until the cord ceases to pulsate. The ligature is now placed around the cord and the cord is cut and a hypodermic of pituitrin 1 c.c. is given deep into the muscles of the mother. The third stage of labor can now be completed immediately if any indication exists, or the placenta can be left from 15 to 20 minutes and often it is expelled spontaneously. If not, the gloved hand can be introduced

and it can be extracted manually. The patient is now put to bed and usually with a binder.

During the past three years a number of physicians have visited me in order to witness my technic in performing a version, and it is their questions and remarks that have suggested this paper. The impressions gained from talking with them leads me still further to the belief that very few men understand the technic or the advantages of a properly performed version. This ignorance is due largely (1) to an almost complete lack of teaching of this subject in our medical schools today and (2) to an amazing amount of inactivity or want of initiative on the part of the practitioner and especially the teachers and professors of obstetrics.

The following are some of the questions put to me by visitors and others:

What are the indications for version and why do you do it? What is the condition of the cervix when you attempt version? What position does the head occupy? How far down is the head before version is attempted? Why do you bring down both feet instead of one foot? Why is the anterior arm delivered first? Why don't you hasten delivery after the umbilicus can be seen? How do you overcome extension of the head and of the arms over the head? How do you save the mother's soft parts, especially the perineum, from lacerations? Why your apparent indifference as to the child's breathing immediately after birth?

Let me answer these questions and at the same time epitomize and dwell on their importance. I also wish to point out that I do a version to eliminate the second stage of labor and thus relieve a woman of the pains and agonies of childbirth.

1. The cervix must be obliterated and the os dilated or dilatable, before version is attempted. This condition is easily determined by careful examination. The cervix need not always be entirely obliterated if it is soft and easily yields to the advancing hand.

2. The position of the presenting head is of no particular importance. A version can always be successfully performed if the presenting head can be lifted above the brim of the pelvis. Sometimes the head is so wedged in the pelvis, when the waters have drained away, that version is impossible. When this condition obtains, delivery by forceps or other means is necessary.

3. Both feet are brought down because the delivery is easiest when this is done; and, if necessary, in the interest of both mother and child, the labor can be terminated more quickly. By pulling on both feet the obstetrician distributes traction more evenly and thus secures a better dilating wedge.

Both feet, instead of one foot, should be brought down at the same time.

No attempt to deliver the arms should be made until the scapulæ are outside the vulva. The anterior arm should always be delivered first.

4. The anterior arm is delivered first because by so doing we relieve the stretching and tension of the soft parts of the mother, and permit

Fig. 9.—Anterior shoulder delivered under pubic arch.

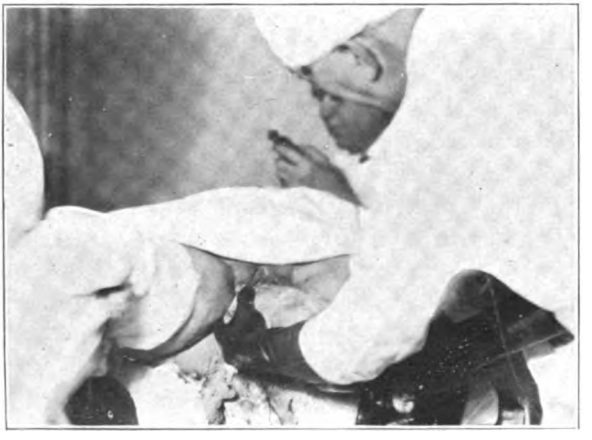

Fig. 10.—Rotating posterior shoulder to position of anterior shoulder.

rotation of the child's body so that the posterior arm now becomes anterior.

5. I never hasten delivery after the umbilicus comes into view because experience has taught me that haste is unnecessary; that severe complications such as extension of the arms and of the head are very

Fig. 11.—Rotation of posterior shoulder completed.

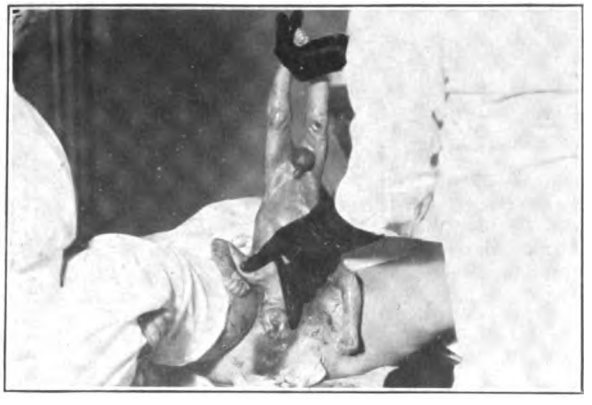

Fig. 12.—Delivery of the well-flexed head.

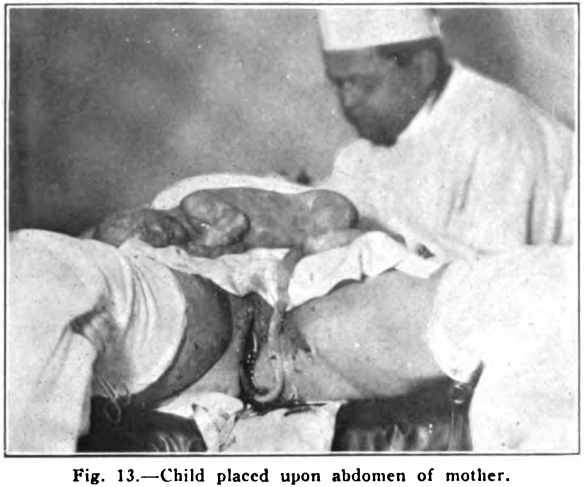

Fig. 13.—Child placed upon abdomen of mother.

Fig. 14.—Prolapsed cord.

apt to take place when we interfere with the natural forcing powers at this particular stage of delivery.

6. Extension of the head is overcome by aiding flexion of the head with the fingers of one hand in the child's mouth, and with the other hand making gentle pressure upon the head over the pubes.

7. The perineum and soft parts of the mother are saved, first of all, by deep anesthesia; secondly, by having the patient in the partial Walcher position, which gives one good control and admits of slow and safe delivery of the head after the vagina and perineum have been previously ironed out and properly dilated.

8. I am apparently indifferent to the child's breathing immediately after birth. Experience has taught me that nearly all of the babies begin to breathe spontaneously when let alone, provided the heart is beating. Occasionally when respiration is unusually delayed a catheter is passed into the trachea. Rough handling of the baby after it is born is never tolerated.

9. During the delivery, as soon as the mouth is exposed over the perineum the baby's body is raised up to let the mucus run out of the mouth. Blue babies give me no anxiety but white babies do.

10. The operator must remember that in the delivery of the head extreme flexion is necessary and that this flexion can be best produced by placing the fingers of one hand in the child's mouth and by making gentle pressure upon the head over the pubes with the other. If extension of the head takes place notwithstanding every care, complications at once arise but in the hands of an experienced operator extension of the head does not occur or at all events is very infrequent.

11. When the chin and mouth have been delivered the mucus will run from the child's mouth and nostrils or it may be milked out by gently stroking the neck and thus many children will breathe before delivery of the head is complete. Therefore haste is unnecessary.

12. Too great pressure upon the mother's abdomen during delivery of the head should be avoided for fear of injuring the bladder or lower anterior uterine wall.

13. The after-coming head may be delivered by forceps if necessary.

14. The operator should at all times have a perfect knowledge of the position of the child *in utero* before version is attempted and an exact knowledge of this can be obtained only by introducing the hand to the fundus and exploring the uterus and the fetal parts carefully.

Men have criticized me for saying that I find posterior occipital positions in from 60 per cent to 70 per cent of my cases. It is because I examine these women many hours earlier and before rotation has taken place.

15. If the membranes have not been ruptured, it is well to separate them all around and as high up as possible from the uterine wall before rupturing them. The rupture should be made high up for the purpose of retaining as much of the amniotic fluid as possible.

16. When the knees of the child appear at the vulva, the version is complete.

17. The operator should be master of the situation at all times and with the child's chest resting in his hand he can watch the fetal heart as he can feel its pulsation in his hand. I have never broken an extremity in a living baby during version. On three occasions the humerus was broken in delivering dead babies and when haste was necessary in the interest of the mother.

18. The extreme lithotomy is not the best position for the patient when a version is performed. The modified Walcher position admits of better results by relaxing the soft parts of the mother. This position can be obtained only by having the assistance of two attendants who hold the legs one on each side or by allowing the feet of the patient to rest upon two chairs if assistants are not at hand.

19. When the child is born, it is placed on its right side across the abdomen of the mother. This position aids perhaps in the closure of the foramen ovale. The child remains upon the abdomen until the cord is tied and cut. At this point I should like to enter a protest against the too common practice of spanking or beating the baby to make it breathe, as this is unnecessary and may do harm. I rarely have to do anything except hold the baby up with its head down to allow the mucus to run out of the mouth or blow a few times upon the child's chest to establish respiration quickly. Sometimes we breathe into the child's trachea through a small catheter but not very often. In my early practice I did this more frequently but now I know that haste and anxiety in inducing the child to breathe are seldom necessary.

20. The third stage of labor may be completed by delivering the placenta manually. It is my practice, however, to administer by deep hypodermic injection into the muscles of the mother, 1 c.c. of pituitrin immediately after the birth of the child and in a very short time the placenta is expelled with very little hemorrhage.

I never bag these cases, because a natural dilatation of the cervix is desired and this is not obtained when bags are used. The dilatation and retraction of the cervix which leads to the desired obliteration begins above and is not the same as that brought about by the use of bags. Bags also displace the presenting part and predispose to prolapsed arms, a thing that happened twice last week in New York City, which I have not seen before in three months.

Now what advantages do I claim for my method of version?

1. The woman suffers no pain after the dilatation of the os has taken place. Therefore I eliminate the second stage with all its suffering and it seems to me women will not dread their confinements and will have more children.

2. The soft parts are thoroughly dilated and are not for a long time

subjected to pressure so that a relaxed, flabby vagina, and torn perineum and prolapsed bladder does not occur in our practice.

3. We see no temperature in our cases because we believe that tender tubes and ovaries, and perhaps many of them the subject of latent gonorrheal infections, are not lighted up into activity by the long pressure and bruising of the on-coming head.

4. The woman suffers no shock and therefore should be more resistant to possible infection.

5. There is no bleeding of any moment in our cases and the uterus remains contracted and in better condition after the delivery is effected. The lochia is less in amount.

6. We believe the baby's head is subjected to less compression injury than is the result after a long and tedious labor and especially after a forceps delivery. Therefore epilepsy and other cranial complications should be less common than after ordinary labors.

7. Of lesser importance but yet a justifiable consideration, the attending accoucheur is worked less, has more leisure and finds his specialty an agreeable one to practice, instead of what it is now, the bugbear of medicine.

The maternal mortality in properly selected cases should be *nil.* The maternal morbidity is no greater and I am satisfied is much less, than that in normal cases and my records and temperature charts will prove this statement. Compression injuries to the baby's head are very rare. In my experience the mutilation of the soft parts of the mother is less than in forceps deliveries or as is seen in long protracted second stage labors and in the end these patients go home in good condition, happy, and well satisfied. I have never torn the perineum through the sphincter and only rarely up to the levator, while injuries to the bladder do not occur because the bladder is always emptied before the version is started and is always lifted so high up that it is not even seen during the delivery and therefore it is not torn off from its pivotal point of attachment at the internal os or from the descending rami of the pubes and ischium.

The fetal mortality was certainly no greater than that which is attendant upon other methods of delivery. Cord complications must always be seriously considered when we speak of stillborn children. I believe the cord is responsible for the greatest number of fetal deaths. In many cases this is not recognized on account of the concealed type of prolapsus funis, when the cord is caught between the head and the brim of the pelvis and the death of the child follows from pressure upon it.

For various conditions I have delivered by version and reported, 2900 cases. I have never broken an arm or leg of a living baby—three times an arm of a dead baby was broken when haste was necessary in the mother's interest. I have never had any alarming hemorrhages

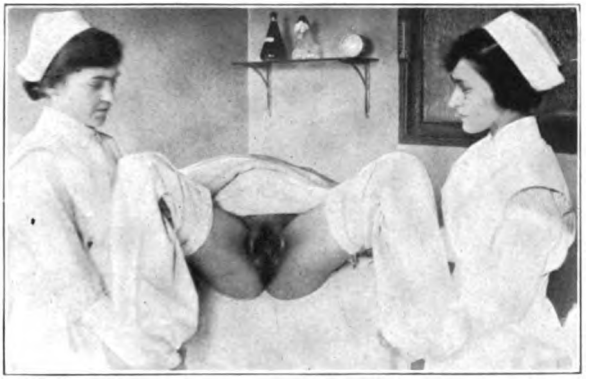

Fig. 15.—Proper position with assistants.

Fig. 16.—Proper position where no assistance is at hand.

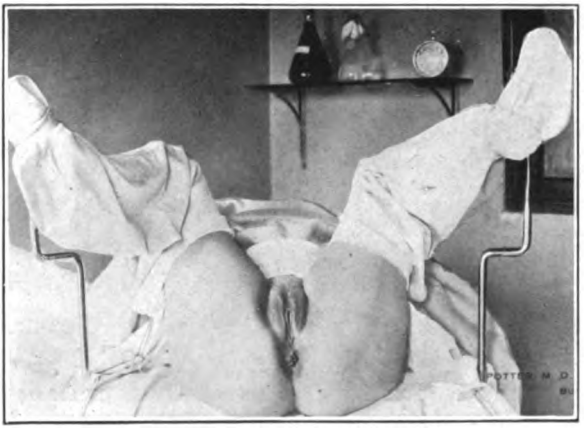

Fig. 17.—Improper position for version.

and the period of involution of the uterus in all of these cases was shorter and with less lochial flow during the lying-in period. I never had a case of postpartum hemorrhage. Convalescence too was more rapid. I attribute this favorable condition to the absence of all shock which is so often experienced by patients who go through a long second stage of labor. The uterus was not tired out neither was the delivery precipitate. Then too there was present greater strength and a better sense of well-being at the end of the puerperium.

Fig. 18.—Properly gloved hand for version.

Fig. 19.—Improperly gloved hand for version.

As I have previously stated, for the year ending August 31, 1920, I personally delivered 1113 women, 920 of which were delivered by version. Of the 920 versions, 400 were primiparæ and 520 were multiparæ. There were in this total number of cases:

80 abdominal Cesarean sections.
13 footlings.
22 breech cases.
2 vaginal Cesarean sections.
39 instrumental deliveries.
2 cases were delivered by instruments on the after-coming head following version.
There were 9 cases of twins.
12 cases delivered themselves before they could be reached.
There were 10 cases that were delivered as vertex cases.
There were 3 face cases, 2 with the chin anterior and 1 with chin posterior. It was necessary to do a craniotomy in one case.

There were 41 stillborn children, classified as follows: breech, 2; short cord, 2; hydrocephalus, craniotomy, 1; prolonged labor, faulty presentation, 1; prolapsed cord, no pulsations felt, 5; hydrocephalus, 2; hydrocephalus, spina bifida, 1; face presentation and prolapsed cord, 1; twins, premature, 4 months, 1; disproportion between child and pelvis (weighed 10 pounds each), 3; eclampsia, 1; macerated fetus, 6; monster, anacephalic type, 5; cord around legs and arm, 1; macerated fetus, specific, 1; albuminuria of mother, 1; L.O.P., 1; placenta previa, 7 months, 1; fibroid tumor, complicating labor, 1; brow, 1; marginal placenta previa at term, 1; diabetes in mother, 1; faulty position of head at term, seen in consultation, instruments had been applied, child dead, 1.

Of the complications those having to do with the cord were most numerous and seem to bear out my statement made previously that cord complications are the cause of the majority of our stillborn children.

There were 16 prolapsed cords; 10 short cords; complete knots were found in 3 cases; twisted cord was found in 2 cases; the cord was around the neck once in 37 cases, twice in 13 cases, three times in 3 cases, four times in 1 case, six times in 1 case, with a living child; once around the neck, and between the legs 4 times; twice around the neck and between the legs 2 times; cord between the legs, necessitating cutting before delivery, 5 times; cord around both legs, once.

There was one case of loose placenta and one of adherent placenta; marginal placenta previa, 7 cases; central placenta previa, 2 cases.

The largest baby was 12½ pounds, another weighed 12 pounds, 1 ounce.

There were 34 children who died in the hospital before being discharged or inside of 14 days from birth classified as follows: One congenital syphilis, aged 8 days. Fourteen convulsions, from 36 to 72 hours. These were not after difficult deliveries so I am satisfied they were not the result of cerebral or petechial hemorrhages.

One hemorrhage into and rupture of suprarenal gland—found by autopsy 4 days after birth.

Ten were bleeders living from 2 to 6 days who bled from the mucous membranes, bowels, eyes, nose, etc.

Five cases of inanition living from 6 to 10 days and the cause of these deaths I cannot explain.

Three monsters living from 2 to 3 days.

Two mothers died who had been delivered by version, one a poorly nourished patient sick with a colitis and running a temperature for a week before delivery, living 41 days and then dying from the effects of her colitis which she had had for years. Blood cultures 3 weeks following delivery were sterile. The second case was up and around the hospital ready to go home, when she developed a lobar pneumonia, from which she died four weeks after delivery.

DISCUSSION

DR. ROSS McPHERSON, NEW YORK CITY.—Everybody that goes to Buffalo and sees Dr. Potter's work comes back convinced that there is a good deal in his method. I know of at least half a dozen surgeons who in the last year or two have visited Buffalo, have seen Dr. Potter operate and have all become convinced that he has accomplished a great deal with his work.

In view of the number of cases which Dr. Potter has reported, this Association should begin to manifest something else besides a critical and destructive attitude towards his work. When you eliminate the cases which have died from other causes than the delivery, his stillbirth figures compare very favorably with those published elsewhere.

I have tried two or three versions on the plan Dr. Potter has outlined and I confess that the shoulder delivery has appealed to me tremendously as I have always delivered the other way.

I have been skeptical as to the results in regard to perineal laceration but in a case I had day before yesterday, a primipara, the baby weighed nine pounds and there was insignificant laceration. I have never before succeeded in doing version without making a regular laceration which required considerable repair and I have been amazed at the satisfactory results where the vagina is thoroughly dilated and delivery is done slowly.

I wish Dr. Potter would tell us more about the delivery of the aftercoming head, for this is a very important point and I hope that he will show us how he proceeds with the aftercoming head as soon as the arms and shoulders are delivered.

I do not believe however that we can trust every general practitioner doing obstetrics to perform this operation, because the minute this practitioner gets to manipulating the interior of the uterus and doing internal podalic versions, he will not only rupture the uterus and have infections, but will also have an increased mortality among his babies. I do think, however, that if every one who is doing operative obstetrics, will go to Buffalo and see Dr. Potter work and learn how he does his operation, he can get a great deal of valuable information and improve the results he has had in versions in the past.

DR. ABRAHAM J. RONGY, NEW YORK CITY.—For four years I have opposed Dr. Potter's teaching and I am still of the same opinion. However, through the kindness of Dr. Potter I had the opportunity of witnessing two versions performed by him. Since then my reason for opposing his teaching became still greater because I found Dr. Potter to be a master in obstetrics and I dare say that there is no one in any lying-in hospital in the United States that knows how to perform versions so well as Dr. Potter. I honestly believe that it is still a dangerous procedure to be applied by the average obstetrician in any of the lying-in hospitals.

What Dr. Potter can do very few of us are able to do as far as version is concerned, but I do want to reiterate that this procedure must not be made light of otherwise it will be undertaken by those not competent to perform it.

DR. HERMAN E. HAYD, BUFFALO, N. Y.—You cannot imagine how pleased I am to hear the obstructionists endorsing the excellent work of Dr. Potter which they saw in Buffalo, some of the results of which he presented to the Association some years ago. At that time, as many of you know, his statements were questioned and he was thought to be not only unscientific but dishonest.

It seems to me it is an absurd position for Dr. Rongy to take when he says that even a skilled and experienced obstetrician cannot do this work as well as Dr. Potter. I will admit that with such an arm as Dr. Rongy has he will not be able to do it as well as Dr. Potter but yet he will do it without danger to mother or child.

When we go to witness the Mayos operate, or to see Dr. Crile operate, we see the masters and yet many of us do some of our operations in the abdomen just as well and as skillfully as Dr. Crile and the Mayos do them. You can do this operation of version well if you go to Buffalo and learn how to do it properly. It is absurd to say that Dr. Potter has supernatural powers. He has simply had a lot of experience and he is just as skillful in doing version as Dr. Crile is in doing thyroid operations. Dr. Crile may beat me in doing a thyroid operation, he will beat me in time and in technic, but my patients all get well the same as his.

Just think of it, gentlemen, in the city of Buffalo we have about 13,000 children born every year. We probably have over 800 doctors, besides all the midwives, and yet Dr. Potter delivers over one-thirteenth of the babies born in Buffalo. You can hardly believe that, but he has shown by his records that there is nothing better in the whole world. Last year he did not have a death; this year he has had two deaths, one of them with pneumonia after the woman left the hospital, and another one forty days after delivery with some kind of infection. There is no record in the world of which I am familiar that can touch it, and what is the explanation? The explanation is, first of all, asepsis; second, profound anesthesia; third, no traumatism to a latent gonorrheal pus tube; no injury of any of these tissues that produce infection that will go on for two or three or five or six weeks. There is the elimination of pain; a certain amount of individual recreation to the obstetrician so far as the work of obstetrics is concerned. Of course, when I say recreation, I mean that he can do this work just as you and I do an operation. When a patient is in labor he makes an examination, and from his experience he knows in half an hour whether dilatation will be sufficiently advanced and then he can make the necessary delivery.

It has been said that this must not be taught in an Association like this, it will do harm. I do not think it will do any more harm than when you teach students the way to do abdominal section and because a thing may have some evil attached to it we must not lose the good it may have also. The ordinary doctor is not supposed to do this kind of work, and he does not do it and he cannot do it, but that does not militate against a first-class, trained man doing it. Yes, we have in our Association a man, who is the only man that has ever brought anything new in obstetrics in the last fifty years, outside of aseptic surgical practice.

DR. E. GUSTAV ZINKE, CINCINNATI, OHIO.—When Dr. Potter presented his first paper, five years ago, there was not a man present who supported him in his practice, and it was very hard to restrain the members from having him expelled from the Association. There is no rule without an exception. I am the exception in this case, for Dr. Potter taught an old man a new trick. While I did not believe everything he said at that time, I did not think he was lying, for the manner in which he presented the subject was so impressive that any man who had listened to him attentively felt he was sincere, and I asked the members to deal kindly with him; to wait and see. I went to Buffalo, therefore, to observe him at his work. He performed several versions in my presence, and did them most skillfully and successfully. He is able to teach the younger men how to do his work, and there is where lies his chief merit. Think of a man's delivering 1100 women, personally, within a year! That is a marvelous accomplishment in itself. Of course, we must not forget that he lives in his automobile; he sleeps upon the floor in the patient's home; he rests almost anywhere, in any position, under all conditions. He is devoted to his patients and to his practice. It is the duty of every man who attends to the practice of obstetrics, and who intends to practice it in the future, to see Dr. Potter while he has an opportunity, for we never know how long Dr. Potter may last, and his method of practice should not be lost. It is undoubtedly of benefit to suffering womankind. It helps the obstetrician; it saves suffering; it saves lives.

DR. WILLIAM G. DICE, TOLEDO, OHIO.—I do not dread breech cases as I formerly did, especially cases of extended arm, after seeing the work of Dr .Potter and with what ease he manages the arms. Delivery of the extended arm is now made by me in accordance with the method he has described.

I think it would be of interest to those here, because he has undoubtedly taught a number of men, if he could give us definite statistics of the work of these other men which would possibly throw some light on the ability of those less skilled to do this work.

A question which has come to my mind is that I see rupture or bursting of the membranes early in labor, and frequently before labor begins, and of course we have then a different situation with which to deal. I simply wish to ask in regard to these cases of dry labor, whether he has any greater difficulty in dealing with them.

DR. JAMES A. HARRAR, NEW YORK CITY.—I would like to emphasize a few things, the omission of which may have been noticed by those of you who have seen Dr. Potter work. First, that he uses his left arm in going after the feet, no matter how the baby lies; second, the extreme deliberation with which he makes the breech extraction. It is a continual glacial-like movement of the child. You see not one inch being born instantly; third, the pressure of the rigid fingers of the external hand just above the symphysis and below the uterus digging in to deliver the head through the brim; and last, the gentleness and unconcern with which he handles the newborn child. The babies are not spanked or tubbed. He strips the pharynx externally, lays the baby down and turns to the management of the mother. In seven or eight or ten minutes the baby begins to whimper and the spectators breathe more freely.

DR. POTTER (closing the discussion).—I feel I owe a great deal to Dr. Zinke and Dr. Hayd for the manner in which they have discussed this operation. The first time I heard Dr. Zinke discuss this subject I thought he would have a stroke of apoplexy, and I thought I would be hanged for murder. (Laughter.) Since the Indianapolis meeting we have been doing versions more frequently each year.

Dr. McPherson spoke about the delivery of the aftercoming head. There is a maneuver that is of great assistance. After the shoulders are out, the operator puts the first two fingers of his left hand in the child's mouth, and with his right hand above the mother's symphysis aids flexion of the head, and makes what pressure is necessary on the aftercoming head, but we never make pressure on the aftercoming head until the shoulders are out. We do not get the arms over the head. We do not get any locked shoulders. I do not know anything about that, although other practitioners say that they have it and why do not I get it? It is because they push the head down between the shoulders, the head being a movable body goes between the shoulders and up go the arms, and then you have extended arms every time. You should get the shoulders out first and the head flexed in the pelvis and guide with your fingers in the child's mouth. If there is any assistance needed, I now have my anesthetist help with the aftercoming head. With gentle pressure from above, the head now passes through the pelvis, being guided by my fingers in the child's mouth. If it is necessary, I put forceps on to raise the aftercoming head and finish the delivery with forceps.

One man who has seen me do this work has done a hundred and fifty of these versions without any difficulty in the past year. Another has done 121. I presume there are others who have done fully as many without any trouble. Many practitioners are doing this operation in their various localities.

Dr. Rongy said it should not be taught. It has been taught to these men, and I do not hesitate to say it can be taught to competent men.

So far as Dr. Dice's remarks are concerned, he must not lose sight of the fact that

a breech presentation is a different proposition from a version. In a version we have flexion, and when once we lose flexion we are lost; when we have a breech, we get the head extended. In version we maintain flexion.

As to the point made in regard to rupture of the membranes, I do not think that is any bar to version. If the uterus is relaxed under anesthesia so I can lift the head up, I perform version. I use my left hand in the uterus because it is easier for me. Slowness is a matter of necessity. The time it takes to do this operation is variable. In some cases I have been twenty-three minutes in delivering the baby. We do not spank the child; we do not put the child in cold water. I use a small catheter in the larynx for resuscitation, and start with a little manipulation of that catheter, pressing the air out. That is seldom done, however.

PATHOLOGY OF COMMON PUERPERAL LESIONS

By John Osborn Polak, M.D., F.A.C.S., Brooklyn, N. Y.

IT IS estimated that twenty thousand women in the United States die annually from childbirth and approximately 43 per cent of this total succumb to puerperal infection, not to speak of the thousands of women who are permanently invalided, as a result of the morbid processes which these infections produce. That this high mortality is preventable cannot be contradicted; yet year after year, the same students whom we send out from our medical schools, whom we have trained in asepsis and conservation, continue to infect and traumatize their patients. It seems odd that the physician who would hesitate to open the abdomen for the removal of a simple appendix, feels perfectly equipped as soon as he has obtained his diploma, to apply forceps or to do any of the several obstetric operations, without a pang of conscience or apparent appreciation of the great danger of infection and the chance of losing both the mother and the child.

I am glad to say that in the past few years in the Metropolitan district, there has been a definite diminution in the amount of septicemia seen by those of us who are practicing consultation obstetrics. Perhaps this is due to the fact that many of the profession are specially preparing themselves for obstetric practice; for most teachers are endeavoring to make the specialty just as important as major surgery.

One cause of the relatively high mortality, is the confusion which exists in the minds of many as to the exact pathologic diagnosis in any given case. The pathology in a case of puerperal infection should be just as definite as the pathology of a surgical lesion; yet almost all cases of childbed fever are included under the general term of puerperal infection and accorded empiric treatment. The purpose of this brief paper is to outline the pathology and clinical course of the several common puerperal lesions, and suggest the indications for, and summarize the treatment to be employed.

A puerperal infection, like any other infection, depends on the inoculation of the puerperal wound by bacteria. In order to thoroughly grasp the physiologic process which actually takes place we must appreciate the fact that the uterus during involution is a puerperal wound. Its interior is undergoing the normal process of repair, and inoculation of this wound will produce either a toxemia or a definite inflammatory reaction, depending largely on the character of the infecting organism.

At first this wound infection is a local process which may be illustrated in the infected perineum, or the infected cervix tear, or the

infected endometrium. In each there is an inflammatory reaction in the adjacent tissues, which limits extension of the infective process and confines it to a circumscribed area about the wound or within the uterus. In these localized lesions the pyrexia and other constitutional symptoms are due to two factors, the toxemia resulting from an absorption of the toxins liberated by the bacteria, and to the tissue reaction excited thereby.

The process may be a spreading infection extending beyond the wound area; this is due either to the increased virulence of the infecting bacterium or to the diminished resistance of the tissues. This spreading infection may occur by extension through the lymphatics within the walls of the uterus, or by spreading to the lymphatics in the parametrium produces a parametritis, or a peritonitis, or even a bacteriemia. The infection may also extend through the blood vessels in which case it manifests itself clinically as a thrombophlebitis, an embolic pyemia, or a bacteriemia.

Considerable blood loss at the time of labor always predisposes to infection, for in cases of hemorrhage the uterine retraction is faulty as there is more or less uterine atony. This lowers the individual resistance and consequently reduces the immunity and tissue reaction. Sampson has shown, by injection of the uterine cavity, that proper retraction and contraction of the uterus with an intact endometrium offers a barrier against venous invasion. He found that, with the uterus contracted and the endometrium intact, it was not possible to force a barium solution from the interior of the uterus into the venous radicals. On the other hand, after the endometrium has been removed by the curette, or during menstruation when the endometrium was partially desquamated and the uterus relaxed, he was able to inject material from the interior of the uterus directly into the venous circulation.

This to my mind, is the best proof that a retracted uterus with its normal granulation zone acts as a barrier against the invasion of bacteria from the vulva, vagina, and cervix. Bacterial flora are normal to these regions; but are usually inocuous unless they are introduced beyond the os internum and into a favorable culture medium. After the first forty-eight hours of the puerperium, bacteria may be found within the cavity of the uterus; but if the normal process of wound repair continues, the cavity sterilizes itself by the end of a week. The endometrium becomes infected by the ascent of this vaginal bacterial flora, which is either carried into the uterus by the hands of the obstetrician or by his instruments, or it ascends along bridges of membrane hanging down from the cervix. This permits the bacteria to ascend from the vagina through the cervix, which has had its protective barriers removed by the process of childbirth. Whether these bacteria, when they reach the interior of the uterus, become scavengers

or virulent invaders depends largely on the contraction and retraction of the uterus and on the virulence of the bacteria.

If the uterus is well retracted, a leucocytic barrier is thrown out between the infected endometrium and the venous radical, for uterine retraction actually produces a passive congestion in the endometrial tissues. Furthermore, inoculation of the surface of the endometrium immediately excites tissue reaction in the basic membrane and adjacent muscle tissues and the leucocytic wall becomes supplemented by a layer of numberless round tissue cells and this causes the endometrium to be exfoliated in masses and substitutes a granulation zone.

If one can picture the entire interior of the involuting uterus as a large granulating wound, we will be less liable to mistake our indications for surgical treatment. In our experience, infection of the endometrium in the relaxed uterus, and inoculation of a wound in the cervix, are the two most frequent pathologic occurrences that follow delivery. In each we have a definite and typical picture. Ordinarily during the course of normal involution with proper uterine retraction and drainage, the uterus in normal position is capable of sterilizing its cavity. However, when retraction and contraction is poor, the contained bacteria not only multiply with amazing rapidity, owing to the retained blood clots which act as a culture medium, but may gain entrance to the uterine and parauterine tissues through the lymph channels or the venous radicals. The puerperal endometrium after labor or abortion should be considered as a traumatized wound undergoing the normal processes of wound repair. This wound may be infected by pathogenic microorganisms in which case it virtually becomes a large puerperal ulcer. It must not be supposed that the presence of necrotic decidua, or a piece of placenta or membrane, or the entire placenta retained within the cavity of the uterus will produce an endometritis. In order to have an inflammatory reaction in the endometrium, there must be bacterial invasion. The retained products of conception simply act as a culture medium for bacteria and favor their multiplication. The presence of retained secundines interferes with proper contraction and retraction of the uterus, which in turn diminishes the normal protection to the individual; and while relaxation favors the spread of infection, it does not produce sepsis, unless there is bacterial infection of the uterine contents.

Clinical experience has shown us that a well contracted uterus in normal anteversion is capable of emptying itself of its contents if infection is not introduced from the outside. A relaxed uterus may become bent upon itself, be caught behind the pubis and become extremely anteflexed, or it may be caught below the promontory and become retroflexed; and thus prevent the free outflow of lochia, produce a lochiometra and favor the absorption of toxins, resulting in local pain and constitutional disturbances. This is a mechanical process

which is immediately relieved by the establishment of free drainage. On the other hand, a putrid or saprophytic endometritis is an infection of the dead and necrotic superficial structures retained within the uterus which produce irritant material composed of bacterial toxalbumoses and ptomaines. These in turn irritate the endometrium and excite a tissue reaction. These superficial necrotic structures have bacteria in them or on them.

ENDOMETRITIS PUTRESCENT

Contrary to general clinical acceptance Schottmüller has shown that the majority of cases of putrid endometritis are due to an obligate anaerobic streptococcus; but in this form of infection the uterine tissues are protected from deeper invasion by the presence of a well-defined granulation zone. The ptomaine and bacterial toxalbumoses induce an endometritis by chemical irritation which excites a round-cell, proliferation in the deeper layers of the endometrium, and this in turn, brings about a superficial necrosis of the overlying tissues. The degree of this necrosis depends, in part, upon the power of the contraction and retraction of the uterus. If the uterine contents are evacuated within a reasonable length of time, extensive necrosis of the endometrium does not result, but if the tissue reaction continues and the round tissue cells become banked up beneath the endometrium, the necrosis is extensive. If the necrosis is slight we have only an intensification of a normal exfoliation of the mucosa. Thus, with the cause removed, with the emigration of the phagocytic leucocytes and the formation of an antibactericidal lochia, the uterine cavity is cleansed. If, on the other hand, the necrosis is considerable, it may interfere with the normal regeneration of the endometrium; hence the uterine cavity is open to the migration of the pathogenic cocci from below, a mixed infection may develop and the patient may succumb from the severity of the infection.

When a saprophytic endometritis exists within the uterus there is a definite train of characteristic symptoms. The lochia remains bloody and fetid, and is frothy from an admixture of gas bubbles. An examination of the secretions shows the presence of saprophytes and numberless cocci of low virulence. The after-pains continue and from time to time a clot is expelled by painful uterine contractions. These are all evidences of a relaxed uterus. Besides this, there is a toxemia from the absorption of the toxins produced by the superficial necrosis. This absorption from the uterine cavity causes an elevation of temperature and a slight acceleration of the pulse rate. On examination we will find the involution of the uterus retarded; the uterus is large, tender, and more or less relaxed. The abdomen may be slightly distended, but there is no tenderness except directly over the uterus. Should the pelvis be digitally explored, the cervix will be found open, swollen and eroded, and if the gloved finger is passed into the uterine cavity, clots and

necrotic debris are encountered and the interior of the uterine cavity is rough and shaggy. This makes up the clinical picture.

We have come to consider relaxation of the puerperal uterus a serious condition, for it allows the spread of the bacterial invasion through open lymph channels and venous radicals. The prognosis of this type of infection depends on the establishment of proper uterine drainage by retraction and contraction of the uterus. When uterine drainage is established and the leucocytic zone is developed, the fever subsides. Hence, it will be argued, if expulsion of the contents is followed by a prompt subsidence of the symptoms, why not empty the uterus of this necrotic debris by surgical methods? Experience has taught us that any sort of trauma to the delicate granulation wall of the puerperal uterus which is confining the infection within the cavity, opens fresh avenues of extension, and that lateral parametritis is a constant sequel of attempts at digital or instrumental evacuation. It does no harm to remove sterile contents but intrauterine manipulation always spreads infection when the content is already infected. It is in this character of case that Dr. Edward Ill, of Newark, has for years been using the alcohol irrigation, with gauze drainage which was suggested years ago by Caroso. We have found that it gives excellent results in these relaxed uteri which are faulty in their drainage because of their position.

COCCAL ENDOMETRITIS

The second type of infection met within the uterus, may properly be called a *coccal or pyogenic endometritis.* In this form the infective bacteria, the streptococcus or other pyococci, have more marked invasive qualities and attack the living tissues. They penetrate into the lymphoid lining of the myometrium, and cause a prompt tissue reaction in the basic membrane and a necrotic layer in the endometrium, which resembles the false membrane of diphtheria.

Whether these cocci advance further than the interior of the uterus, and invade the lymphatics and blood vessels, or remain confined within the uterine cavity, depends upon the completeness and development of the granulation zone, the virulence, and the penetrability of the invading bacteria. If the reaction is sufficient to excite prompt tissue resistance and the leucocytic barrier increases in thickness, the lochia acquires antibactericidal properties which tend to sterilize the interior of the uterus. This observation has been checked up frequently in our clinic. With every puerperal endometritis there is always an associated metritis. This is a defensive reaction on the part of the myometrium against the invading cocci. In this reaction small round tissue cells, leucocytes, fibroblasts, and polyblasts are thrown out and are deposited between the muscle fibers and around the gland tubules, halting the further extension of the cocci. From this primary endometritis and metritis, the bacterial invasion may extend through the lymphat-

ics in the uterus into the surrounding connective tissue, or to the peritoneum, or through the veins in the placental site to the blood stream. Since the infection often begins at the placental site, much depends on its condition at the time of exposure. If the uterus is well retracted and the sinuses are closed the defense at this point is effective. On the other hand, if the sinuses are plugged with aseptic thrombi, virulent cocci may infect these thrombi directly or penetrate between the sinuses and enter the vessel from the outside and thus gain entrance to the circulation. *Infections due to the streptococcus pyogenes and the pyococcus alone* do not give rise to fetor, and the interior surface of the uterus is usually smooth and not deeply necrotic. As a rule the bank of granulation tissue suffices to limit the infection to the uterus, unless Nature's beneficient processes are disturbed by the meddling of the accoucheur. The clinical picture is one of acute infection. The symptoms are of greater severity than in the putrid form and are briefly as follows:

For the first two or three days the puerpera is fairly comfortable, but there is usually some indication of brewing trouble such as malaise, a higher pulse rate and temperature than is normal, restlessness, pain in the uterus, and prolonged after-pains. On the third, fourth or fifth day, there is a slight chill or chilly sensation with a rise of temperature, headache, anorexia, and the patient is conscious of a feeling of heat over the body. The pulse may range from 100-140 and the temperature from 101-104° F.; depending on the severity of the infection. The abdomen may become slightly distended, but there is little or no tenderness except directly over the uterus; the involution of the uterus is always retarded. If, however, the infection extends through the myometrium to the peritoneum, there is tenderness over the uterus and in both inguinal regions. The lochia is at first unaltered, but within forty-eight hours it loses its characteristic qualities and becomes serous, flesh colored, or seropurulent. The lochia is not foul unless large numbers of saprophytes are present. The lochia, however, has caustic infective qualities, and the wounds in the vagina and about the vulva, which are bathed in them, are covered with a pseudodiphtheritic membrane.

On physical examination, the cervix is closed and the uterus fairly well retracted and unless there has been parametrial extension, its mobility is not interfered with. Were it possible to make a digital exploration of the interior of the uterus, it would be found smooth and the endometrium bathed in an odorless purulent or sanguinopurulent discharge. Lymphatic invasion from the cervix is shown in the parametritis postica so commonly found postpartum, which is the chief cause of the backache experienced in the puerperium. Extension of infection from tears in the cervix, and higher up in the uterus, is generally through the lymphatics in the broad ligaments. This extension produces a lateral parametritis or cellulitis.

CELLULITIS

Pelvic cellulitis or parametritis is an inflammatory reaction of the pelvic cellular tissue to a bacterial invasion. The bacteria reach the parametrium through the lymph stream and excite a tissue reaction in which serum, leucocytes and round tissue cells are poured out producing a local inflammatory swelling. In order that we may better appreciate where to look for these inflammatory swellings, it may be well to briefly review the anatomic arrangements of the pelvic connective tissue.

The pelvic connective tissue lies under the peritoneum and between the pelvic peritoneum and the pelvic diaphragm. It forms the loose connecting and supporting areolar structure between the organs and the pelvic wall, between contiguous viscera and the soft structures. It spreads from the uterus as a center and radiates outward in all directions, each part reaching the pelvic wall. It surrounds and supports the blood vessels, nerves, lymphatics, and forms thin sheaths. It is condensed into strong bands and ligaments forming the aponeuroses of muscles and the ligamentary attachments of the pelvic viscera. Infections from traumatisms of vagina and cervix chiefly involve this loose, fatty tissue and the infection is directed by and confined between the fascial sheets and ligamentary planes.

The lymphatic channels which drain the greater part of the vagina, the cervix and lower uterine segment pass out along the base of the broad ligament, and are supported by this arbor of cellular tissue. These follow the course of the uterine vessels to the hypogastric and iliac glands. The lymphatics of the fundus and upper part of the body of the uterus follow the ovarian vessels in the infundibulopelvic ligament to the glands at the bifurcation of the aorta and the lumbar group. Lymph channels also run into the uterosacral ligaments to the sacral glands and through the round ligaments to the inguinal glands.

ETIOLOGY

The majority of cases of cellulitis are due to infection by the streptococcus pyogenes. The staphylococcus and bacillus coli, and occasionally the gonococcus, are found in combination, but the streptococcus is the chief infecting agent of cellular tissue. The severity of the infection depends on the virulence of the infecting organisms. It has not been proved that the gonococcus can by itself produce primary pelvic cellulitis, neither does an uncomplicated gonorrhea give rise to the same inflammation and abscess formation seen in a streptococcus infection.

The most common avenue of entrance is through injuries to the cervix and vaginal vault during labor; for besides the general softening of the tissues, the enlargement of the connective tissue spaces, and the increased vascularity due to pregnancy, there is a direct bruising of the parts during labor, all of which favor infection.

The cervix and surrounding tissues are subject to the greatest trauma, consequently the tissue resistance here is lowest. Furthermore, lacerations at these points open into extensive cellular spaces. Even trivial injuries may act as points of ingress; but, as a rule, there is the history of an instrumental delivery, manual or bag dilatation, or a dry labor with frequent vaginal examinations. The chances of infection are greater under these circumstances. This form of inflammation is comparatively rare after abortion as the cervical tissues are not subjected to such a degree of trauma; hence, tubal rather than parametrical complications with peritoneal extension are the usual course.

PATHOLOGY

The organisms invade the lymphatic channels and by their presence, and the toxins they produce, excite a hyperemia which is followed by an effusion of protective serum and a hurried migration of leucocytes into the soft areolar tissue, which with the deposition of small round cells make up the exudate. This increases the tissue bulk and gives rise to a soft swelling which later becomes hard from the formation of a more fibrinous exudate. This exudate is generally limited, at first, to the base of the broad ligament on the involved side. As the exudate is poured out, it follows the line of least resistance in the cellular tissue between the fascial sheets forward and outward to the anterolateral pelvic wall and iliac fossa; or it may proceed backward along the uterosacral folds, lifting the posterior layer of the peritoneum. The fibrinous deposit which is thrown into the pararectal and prevertebral connective tissues fixes and displaces the uterus and rectum, and more or less obliterates the portio vaginalis, holding the pelvic organs in a hard sensitive mass; or the exudate may spread forward to the base of the bladder and so reach the anterior pelvic and abdominal walls.

Clinically we have found that the exudate may spread in almost any direction along the cellular tissue planes. It may be unilateral or bilateral, most frequently the former; or it may spread around the cervix from side to side, obliterating the portio vaginalis, leaving the os as a mere dimple in the vaginal vault; or the bacteria may follow an unanatomic course, even passing through muscle or fascia, in which case the exudate may be found in locations where it is least expected. The exudate varies in its extent and consistence depending on the virulence of the germ and the resistance of the patient. In mild cases there may be nothing but a simple inflammatory edema; and again, in the more virulent types of cellular infection, the exudative process is limited to a serous and poorly defined cellular infiltration, for the bacteria quickly pass through the lymphatics to the peritoneum or into the blood stream. Fortunately for the protection of the individual in most cases there is an adequate protective tissue reaction with the formation of large exudates. Section through these masses shows the lymph vessels thickened,

tortuous and beaded, and a yellowish or whitish pus exudes from numberless minute openings. The lymphatic chains are surrounded with exudate giving it a glistening, glassy, moist appearance. The veins are often thrombotic, either from primary or secondary infection; or the thrombi may undergo puriform degeneration, the debris breaking up and getting into the circulation forming infected emboli.

As the exudate increases in size, the blood supply is increased; this is especially apparent on the venous side and later, as cicatricial tissue forms and the scars shrink, the arteries are kinked and varicosities occur in the veins, while the ganglia and nerves may become pinched in the contracting cicatrices. This explains the pain and the frequency of pelvic varicosities in patients who give a history of an infected puerperium.

Coincident with the pouring out of exudate into the cellular tissues in the broad ligaments there is always a subperitoneal edema and necessarily the pelvic peritoneum takes part in the inflammation and throws out an exudate upon its surface which causes the tubes and ovaries to become matted together and adherent to the broad ligaments, uterus or the intestines, which, clinically, give the impression of large exudate masses.

It may be stated that parametritis always excites some degree of perimetritis. This inflammatory exudate may undergo complete absorption or may go on to suppuration. If absorption occurs there is always some pathology which permanently remains. When an exudate suppurates the pus is discharged externally or becomes encapsulated, limiting the mobility of the pelvic viscera and occasioning premenstrual pain. In the milder infections, with a serofibrinous exudation, complete resolution usually takes place. Large masses of fibrinous exudate may completely disappear without leaving much edema or tissue damage. There are, however, always varicosities of the pelvic veins to tell the story of the intense venous engorgement, necessary to supply the protective exudate needed in Nature's attempt to bury the infecting invaders.

In the more severe infections, suppuration may occur with the formation of an abscess cavity or necrotic areas may appear in various parts of the exudate, and these become converted into pus. Commonly there is only one cavity which results from the conjunction of several pus foci. Occasionally the entire pelvis may be riddled with abscesses. Multiple foci of suppuration are commonly of thrombotic origin and really belong to a different class than the simple cellulitic abscess.

These large abscesses, dependent upon their proximity to one of the hollow organs, are apt, in the course of from twenty to seventy days, to point; and unless they are evacuated by operative measures, may break into the rectum, bladder, vagina or through the skin above Poupart's ligament or into the peritoneal cavity. If the pus is completely evacuated, the cavity closes rapidly. Unfortunately when these abscesses open spontaneously, it is seldom at the most dependent point; there may be

other or more remote foci, hence the pus is not completely evacuated and the septic process may be kept up for weeks or months. Sometimes the abscess does not open and Nature cures the condition by encapsulating the pus. The wall of the abscess is thickened and becomes firm with fibrous tissue, while the more fluid part of the pus is absorbed. Such a tumor may persist in the pelvis for years, gradually shrinking in size.

It is important to note that the encapsulated germs do not always lose their virulence, but may on the occasion of subsequent traumatism or operation break out with increased virulence and cause a bacteriemia. Unless there has been considerable trauma of the soft tissues, it is remarkable to see how little scar tissue is left after these connective tissue abscesses heal. On the other hand, when there have been extensive lacerations and trauma of the soft parts, as tears through the cervix, into the lower uterine segment, and into the base of the broad ligament, the woman is left with a permanent displacement of the uterus owing to contraction of the cicatricial tissue.

Pelvic cellulitis may be complicated by femoral thrombosis and phlegmasia alba dolens. Though I believe that the more severe cases should be regarded as a septic thrombosis with an accompanying cellulitis, it is conceivable also to believe that an immense exudate may of itself be sufficient to cause compression of the pelvic veins and produce edema of the thigh or leg. This is so, especially when the exudate is in the anterior portion of the pelvis between the peritoneum and the pelvic bones.

BACTERIEMIA

Bacteriemia means the presence of bacteria in the blood. It is an acute infectious disease, produced most frequently by the streptococcus septicus and occasionally by the staphylococcus. *These cocci with their toxins* produce changes in the blood destroying the red cells, as well as the leucocytes, and cause degenerative changes in the organs through which they pass, notably, the heart, the liver, and the kidneys.

Besides the streptococcus and staphylococcus, which are the most common invaders of the blood stream, the pneumococcus, the bacillus pyocyaneus, the gonococcus, the bacillus aerogenes capsulatus, and several anaerobic bacilli, have been found in blood cultures.

In postabortal and puerperal infections entrance is gained into the blood stream by two routes; first, by lymphatic extension; second, by direct invasion of the venous radicals and sinuses. Each mode of invasion proceeds in a definite manner and the clinical pictures produced differ so much that it is generally possible to make a differential diagnosis. Occasionally, however, the pictures are indistinct and differentiation is impossible. The lymphatic form develops from an endometritis; the infection in turn extends to the myometrium, and the parauterine lymphatics, but it is so virulent that instead of exciting an active reaction in the parametrium and parauterine spaces, the reaction simply

excites a serous exudate with local edema and the infection proceeds directly into the blood stream, or through the lymphatics to the peritoneum, exciting an acute purulent peritonitis. The vascular form almost invariably begins as a uterine phlebitis, primarily as an infection of the thrombi in the placental site with an extension of the infected thrombi into the veins. From these infected thrombi the bacteria enter and multiply in the blood, and consequently locate in distant organs; such as the pleura, the lung, the endocardium, and the brain. Occasionally the thrombi may suppurate, but this is not common in streptococcemia. However, as a result of such a suppuration, bits of infected fibrin or actual pus may get loose and be carried away by the blood stream to remote parts of the body, and there locate and cause local abscesses. The lung, kidneys, and the brain are the points most frequently reached by these infected emboli.

In blood stream infections the local pathologic reaction is considerable, consequently the local symptomatology is insignificant; for whether the bacteria enter the blood stream via the lymphatics, or via the veins, their transit is so rapid and the reaction caused so insignificant, that appreciable local lesions must necessarily be absent. For the entrance of bacteria into the blood stream, there must be a puerperal wound which is inoculated by bacteria. This may be at any point in the genital tract, the vulva, the vagina, the cervix or in the placental site.

Women who have had severe postpartum hemorrhage, or have been toxic prior to their delivery, offer less resistance to coccal invasion than women whose antepartum or interpartum period has been less depleting.

In the vascular forms of bacteriemia the lymphatics are not involved at all, or if so, to a very decidedly less extent. The veins of the placental site are filled with large thrombi which are swarming with bacteria. The bacteria erodes the endothelial lining of the vessel; fibrin is therefore deposited on the eroded surface, and a clot occludes the lumen and this process advances through the venous plexuses of the broad ligament into the ovarian and iliac veins, and even to the vena cava. From the surface of these thrombi, bacteria are liberated into the blood stream, and, if they are strong enough, multiply in it, and a fatal bacteriemia may result. If the bacteria are less virulent the process becomes more chronic, the thrombi undergo puriform softening, and solid bits of thrombus or droplets of pus break loose, float in the blood stream, lodge in distant parts of the body, setting up new focci of suppuration, causing a condition of true pyemia.

SYMPTOMS

A period of incubation of from one to three days usually precedes the outbreak of the severe symptoms. Occasionally threatening prodromes appear within a short time after the inoculation, and the woman becomes seriously ill and may die within thirty-six hours. Ordinarily the

prodromal stage is manifested by the signs and symptoms of the local process in the uterus from the site of which the bacterial invasion of the blood has extended.

In consideration of the pathology, we have shown how bacteria may enter the blood stream with infected thrombi from a local ulcer through the lymphatics, from an endometritis or parametritis, or from the placental site. It is, however, frequently impossible to determine when or how the germs get into the blood; yet since our bacteriologists have been using anaerobic methods, we have often been able to cultivate the streptococcus from the blood where the diagnosis of a purely local lesion has previously been made.

The following syndrome is indicative of a serious bacteriemic infection, though it is claimed that absorption of toxins in large amounts will produce similar symptoms. This I cannot verify from personal experience. Blood invasion is ushered in by a severe chill lasting from five to thirty minutes. During the chill the skin is pale, the face is pinched, and the lips and fingers cyanotic; the temperature rises rapidly to 103-104° F. and the pulse rises at once above 120, varying from 130 to 160. At first the pulse is full and bounding; but it soon becomes soft and compressible, for the bacteria and toxins in the blood weaken the heart muscle. Owing to the rapid destruction of the red blood corpuscles, the oxygen-carrying power of the blood is diminished and the patient exhibits marked pallor; the finger tips are cyanotic, the respirations are hurried, and the woman looks profoundly sick. The white blood cells show no tendency to increase owing to the intense and overwhelming intoxication. As a result of the rapid production of toxins the nonstriated muscle in the heart and intestinal tract undergo cloudy swelling and lose their tone. As the heart weakens, the blood pressure falls, and there is more and more tympany from intestinal paresis. This further embarrasses the heart and respiration. Malaise becomes a prominent factor early in the attack, the woman appears prostrated and is apprehensive of impending danger. Headache and sleeplessness are constantly complained of, and even though the patient has no pain, she does not sleep. This symptom is particularly ominous. The mind may remain clear until near the end. This, however, is unusual, as a mild delirium becomes more marked.

The bacteriemic symptoms may occur alone or be succeeded by the symptoms and signs of a purulent peritonitis, i.e., nausea, vomiting and pain. These with the facies hippocratica show the end is not far distant. If the bacteriemia has occurred as the result of rapid lymphatic invasion from a coccal endometritis, local pelvic symptoms may coexist. The lochia are usually profuse and putrid, the result of a gangrenous endometritis; though in the severer types the lochia may be scant and free from odor. The odor is pungent and the puerperal wounds become necrotic. Signs of peritonitis such as tenderness, tympany, spreading

rigidity, ileus, etc., begin, and if the patient lives long enough, the picture becomes one of virulent peritonitis. When this occurs the temperature may go down, but the pulse always rises and the tongue becomes dry. A peculiar sickening fruity odor is noticed about the patient, and while she feels easier, the objective symptoms grow worse. The body is cold, the face flushed, and beads of cold perspiration appear on the forehead; while the nose, lips and ears are of a leaden gray. Death usually occurs in coma preceded by pulmonary edema.

The duration of the disease is from two to ten days. It is especially virulent if it begins during labor, and then its course is usually short and violent. Eruptions on the skin resembling the exanthemata occasionally occur. This has nothing in common with true scarlatina; though the pregnant woman is not immune to the disease. It is really a toxic streptococcic erythema. There is no angina and this helps in making the differentiation.

Broadly speaking, the treatment depends on the pathologic diagnosis and may be considered under the following heads: 1. Local measures which secure drainage and uterine contraction. 2. General supportive measures that increase the patient's resistance, which should include transfusion. 3. Specific remedies are of especial value in blood stream infections. 4. Finally, surgical measures. The latter are only applicable to abscess formations, thrombotic lesions of the pelvic veins, and spreading peritonitis.

DISCUSSION

DR. K. ISADORE SANES, PITTSBURGH, PENNSYLVANIA.—Puerperal infection of pyogenic bacterial origin begins chiefly as a lymphangitis or thrombophlebitis. When we have an invasion of bacteria in tissues there appears a small-cell infiltration; a protective wall thus forms around the invaded bacteria. The less we disturb this area, the more complete the isolation of the bacteria and the better are the chances for their destruction. If we have a thrombophlebitis, the less we disturb the tissues surrounding the vessels, the greater there is the possibility for the thrombus to organize or absorb, and the less are the chances of formation of an embolus or invasion of bacteria into the general circulation.

The first consideration in the care of puerperal infection consists of putting at rest the parts involved. The patient must not be disturbed by the surgeon or the nurse. Intrauterine treatments of any kind seem to us unsafe. Such treatment as described by the essayist is bound to disturb the uterus, the protective infiltration around it, or the thrombotic blood vessels directly or indirectly connected with it.

For a number of years we have been enforcing absolute rest in treating this class of patients, prohibiting examinations, keeping them as quiet as possible and explaining to them the dangers of violent movements, treatments and examinations.

DR. JAMES E. DAVIS, DETROIT, MICHIGAN.—So far as I know, it is almost the prevailing technic to deliver the placenta immediately. After its delivery, the uterus is pushed down by the hand over the abdomen, causing the descent. If the retraction and contraction of the uterus is desirable, this com-

mon practice is, and must be wrong, and militates against the condition that Dr. Polak has so ably called our attention to as necessary.

DR. E. GUSTAV ZINKE, CINCINNATI, OHIO.—If there is any one subject that is not perfectly understood, even by the majority of obstetricians, it is that of puerperal fever. Puerperal fever is always an infection, but the infection is not always the same, and much depends upon when and where the infection takes place after labor.

Dr. Polak said that sapremia has been virtually disregarded. I do not believe that statement is quite true, and, if it is true, I do not think it is wise. It is of the greatest importance to know whether you have a sapremic infection or a septic infection. The difference between the two lies in the fact that a sapremic infection is due to the germs of decomposition. The germs of decomposition live upon dead matter only, and they thrive only on dead organic matter, while the septic germs, the streptococci, attack living tissue at once. They penetrate immediately the wounds within the parturient tract and enter the system either directly or by way of the blood vessels or the lymph channels.

Here is a point of differential diagnosis between the two; in order to make it emphatic and impressive, I shall take the extremes between the two infections. A sapremic infection may exist when the physician and the patient do not even suspect it, or when the patient manifests no very striking symptom. The pulse remains good for several days; the temperature hardly rises in the beginning. Gradually the pulse begins to be more frequent; the temperature rises and fluctuates between 100°F. in the morning and 101°F. in the afternoon. If there is no relief, both temperature and pulse go up, and at the end of a week or more you may have a profound putrescent endometritis, though still sapremic in character,—a condition which promptly yields to treatment if the uterine cavity is gently flushed, as Dr. Polak so graphically described. A sapremic infection is borne comparatively well even by patients whose condition has been weakened by other factors. A streptococcus infection, however, is an entirely different affair, and no matter whether the patient is weak or strong, the outcome will depend upon the activity of the septic germs and the time of entrance into the uterus, especially the placental area. The patient may have presented the appearance of a perfectly satisfactory condition in the morning; in the afternoon or evening you find the picture of apparently perfect health entirely changed. She looks as though she had been stabbed in a vital place. Her face is pale and pinched; she is frightened and seriously apprehensive; she knows she is very ill. She has had a chill lasting probably half an hour or an hour, with a consequent rise in temperature to 105-106° F., or even higher. That is the difference between the two principal varieties of puerperal infection.

A sapremic infection, when recognized early, yields to treatment very promptly; a septic infection does not respond readily to treatment. Even intrauterine irrigations amount to naught, because the germs have penetrated the necrotic tissues and attacked the living structures beneath them. They have entered the system; and, in some instances, produce a phlegmasia alba dolens, in others, a para- and perimetritis, with or without abscess formation, and in still others bacteriemia. Many times there occurs a mixed infection; but in all cases the streptococci predominate.

When particles of placental tissue or membrane are known to be present, they ought to be removed. How are we to remove them? We must not forget one thing,—that Nature in all these cases establishes her own method of defense. We have within the uterine cavity the dead superficial part of the endometrium beneath which lies its deep and healthy structure; between the two, Nature erects

the wall of leucocytes which opposes the entrance of all kinds of germs. If sufficient time has passed to give Nature a good opportunity to finish the wall of protection, even the streptococcus will have a hard time to penetrate this bulwark. If a curettement is contemplated, whether you intend to use the finger or the curette, great care must be taken not to disturb Nature's own defense, the wall of granulations. Much, therefore, will depend upon the time when infection takes place. If it occurs early, the case is much more grave than if it takes place after four or five days, when the uterus is well contracted and the wall of granulations more or less complete.

DR. POLAK (closing the discussion).—In regard to the point brought out by Dr. Davis, I think all of us have adopted in the last few years the method of allowing placental delivery to take place by itself without the expression of the placenta.

Sometime ago I presented a paper, as some of you may remember, on spontaneous delivery of the placenta in 2000 cases, and in those cases we found that the placenta came away of itself without any expression if it was allowed to separate under the stimulus of the uterine contractions.

In regard to Dr. Zinke's point of the difference between sapremia and streptococcus infection, I did not make it very clear because I feel that sapremia is only an exaggeration of the normal exfoliation of the endometrium, and that the dead material is infected by the bacteria which have come up from the vagina. But since we have been making anaerobic cultures we have found a large number of these uteri that had been potentially sterile were of the saprophytic type, and contained the obligate anaerobic streptococcus which, under proper environment, may become an active streptococcus. In our own cultures made from the interior of the uterus, at forty-eight hours, five days, and seven days after labor, we found that about 50 per cent of the uteri cultured contained streptococci after the first seventy-two to ninety-six hours; yet at the end of a week these same uteri were practically sterile of this coccus, particularly if they ran an aseptic temperature, showing that the uterus in its development of the granulation zone will develop an antibactericidal action; consequently we feel, if it is capable of doing that by the formation of this leukocytic wall, all it needs is drainage. Stimulation of the proper contraction and retraction produces a Bier congestion of the uterus. Sampson's descriptions and pictures show how dangerous it is to attempt cleansing the relaxed uterus of its contents.

RUPTURE OF THE BLADDER DURING LABOR

By John Wilson Poucher, M.D., Poughkeepsie, N. Y.

Because the attending physician could not be located, I was called, about 8 P. M., to the maternity ward of the hospital to see Mrs. W., a primipara, twenty-four years of age. The patient had been in labor about six hours. Her nurse, an experienced one, informed me, that the labor pains had been almost constant for the past hour, and had remained so until a few minutes before my arrival, when, after a very severe paroxysm, they had stopped suddenly. Almost immediately after the cessation of labor pains, the nurse noticed that the patient's respiration had become labored, the pulse had become rapid and weak, and that there was every indication of impending collapse.

The following was the condition on my arrival: Thin, rapid pulse; labored breathing; general exhaustion; anxious expression of the face; body and extremities covered with cold perspiration. An examination showed the fetal head low down, almost upon the perineum.

As there had been no labor pains for the last half hour or more, and taking into consideration the marked condition of shock, a diagnosis of ruptured uterus was made, and as the patient was beginning to respond to stimulants, which had been administered, I decided to deliver at once. This was easily accomplished with the forceps under light chloroform anesthesia; and, rather to my surprise, the uterus contracted normally, and expelled the placenta promptly.

The mother rallied rapidly after labor was completed, and I left her feeling very comfortable; indeed, she passed a very comfortable night. The next morning she began to complain of some discomfort, and her nurse discovered that there was considerable abdominal distention. Upon palpating the abdomen, I found that the distention was caused by fluid, and was too extensive to be caused by a full bladder alone.

As the patient had not voided urine since her delivery, and had experienced no desire to do so, the bladder was catheterized, with the result that a large quantity, about four pints, of slightly bloody urine was withdrawn and, at the same time, the abdominal distention disappeared almost entirely.

The patient was at once prepared for operation, and taken to the operating room. A median laparotomy disclosed a transverse laceration of the bladder, about two and one-half inches long, extending across the fundus of the organ. The tear was carefully closed with two chromic cat gut sutures. The abdominal and pelvic cavities were then gently sponged dry of a considerable quantity of urine, and the abdomen closed, with a drainage tube left *in situ*. This was removed the third day. The bladder was drained for the first 24 hours by a retention catheter; but as this was a source of discomfort, it was removed and the bladder was catheterized every two hours for the next two days.

Patient showed not the slightest ill effects from her operation, and was discharged well on the twentieth day after labor.

I find that rupture of the bladder under such conditions is very rare, and that it usually occurs after long, protracted labors, or that it is the result of injury due to instrumental delivery. It is then usually discovered later in the form of uterovesical or vesicovaginal fistula.

The accident could not have occurred in this case had there not been a distended bladder. Although the patient was said to have voided urine frequently during her

labor, she evidently had not emptied her bladder. As the head descended and the bladder became more and more distended it was crowded up above the pubes.

It is self-evident that the operation for a ruptured bladder should be done at the earliest possible moment. In this case, about twelve hours had elapsed with no bad results. The peritoneum appears to have suffered no harm from the large quantity of normal, sterile urine. There was practically no hemorrhage, although the tear in the bladder wall was quite extensive.

Because of the possibility of infection, I did not disturb a very small, harmless, but normal looking appendix, although it was very much in evidence.

A little more than a year afterward, I had occasion to operate on this patient for a large gangrenous appendix, with extensive adhesions. I mention this because I believe that this condition of the appendix is likely to occur after such a disturbance in the peritoneal cavity. I have observed this once after a gunshot wound of the abdomen, where several loops of intestine had been perforated, and where there was considerable hemorrhage from injury to mesenteric vessels. On two other occasions I observed this condition while operating for ruptured ectopic gestation.

1. ACCIDENTAL HEMORRHAGE. CESAREAN SECTION. 2. HEMATURIA IN PREGNANCY

By James K. Quigley, M.D., Rochester, N. Y.

Case 1.—Accidental hemorrhage. Cesarean section. Mrs. E. J., aged thirty-three, para VI, native of New York State. Hospital No. 5429.

Personal History.—In infancy and childhood she had measles, mumps, chicken pox and acute catarrhal jaundice. In adult life she had influenza and pneumonia. *Menstrual History*: Began at 14; always regular; duration five days; flow scant; moderate pain during first day. Last menstruation occurred March 15 and was quite profuse. Estimated date of confinement, December 22. *Previous pregnancies*, considerable headache and edema of the feet. *Present pregnancy* has had the same symptoms plus disturbance in vision. The five *previous labors* were normal, and spontaneous. She had four miscarriages, cause not known.

Present History.—This patient on the day previous to her admission to the hospital fell to the floor, striking her head. She does not remember having struck any other portion of her body. She apparently went into labor at seven o'clock the following morning, having some flow. She sent for her physician who, upon his arrival, found her bleeding profusely and, therefore, sent her to the hospital in an ambulance where she arrived about 1:40 P. M.

Examination.—Patient is of moderate height and weight, very pale, no air hunger manifest. Pulse 124, poor in quality, systolic murmur over base of the heart not transmitted. *Abdomen:* Uterus size of nine months' pregnancy, very tense and board-like, uniformly tender. Palpation of fetal parts impossible. Fetal heart inaudible. Rectal examination disclosed an elongated undilated cervix. Presenting part high. A diagnosis of accidental hemorrhage of the combined type was made. *Blood Examination:* Red cells 3,380,000; white cells 16,600; hemoglobin 80 per cent (Tallquist). Blood pressure 174/132. *Urinalysis*: Sp. gr., 1.020; amber in color; acid reaction; albumin present; no glucose.

The bleeding had almost ceased and the patient began to rally some, though there was no change in the abdominal signs. She was given 1,000 c.c. of saline solution intravenously, later 400 c.c. of blood was transfused from her husband. Forty minutes after the completion of the transfusion she was taken to the operating room. Abdominal delivery was decided upon, not in the interests of the child which had evidently perished, but because it offered the patient the best chance of life.

Operation.—Preoperative preparation was done on the table. Anesthetic: nitrous oxide with a small amount of ether. The pulse at the beginning of the operation was 150. An incision four inches long, with its center opposite the umbilicus, was made slightly to the left of the median line. One c.c pituitrin given. The uterus, when exposed, was found large and very tense, of a mottled purplish color, and ecchymotic in appearance. The peritoneal cavity contained from one and one-half to two pints of sero-sanguinous fluid. Cutting the uterine muscle it looked almost normal in color, showed no areas of hemorrhagic infiltration, and did not bleed as freely as the average case. When the amniotic sac was opened the fluid spurted three to four feet above the patient's abdomen, so great was the intrauterine pressure. The child was promptly delivered and found to be dead. Blood clots sufficient to fill an ordinary wash basin were scooped out and the uterus quickly closed with two layers of interrupted chromic catgut suture. The abdominal wall was closed in the usual way. Time of operation 24 minutes.

The pulse at the close of the operation was still poor in quality, though there was little fresh bleeding either during the operation or following it. One thousand c.c. of saline solution were given intravenously, and one hour after the completion of the operation she had recovered from the anesthetic and said she felt fine.

On the sixth day after the operation she developed a temperature of 102°F. and a septic sore throat, running an afternoon temperature for five days. Believing that another transfusion would increase her resistance, she was given 250 c.c. of her husband's blood; following this she improved, clinically, her temperature falling to normal. As after the first transfusion her white blood-count increased considerably, from 24,000 to 40,500; the first increase having been from 16,600 to 26,500. She was discharged on her twenty-third day, much improved.

Interesting points in this case are: 1. Of the several causes advanced as factors in the etiology of accidental hemorrhage, this patient presented three, viz., trauma, a marked pregnancy toxemia, and a short umbilical cord (17 cm.). 2. Extreme intrauterine pressure. 3. Gross appearance of the uterus in situ, corresponding to that described by Wing,[1] and by the author in a previous publication.[2] 4. Relatively large amount of free peritoneal fluid. 5. Leucocytosis and clinical improvement following the two transfusions.

CASE 2.—Hematuria in pregnancy. Mrs. S. F., aged thirty; para I; private case No. 453. Family history, negative.

Personal History.—Simpler diseases of childhood, appendectomy at 24, "clean case" with this exception, patient has been quite well all her life. Menstruation began at 13; quite irregular at intervals varying from six to eight weeks; flow moderate in amount and accompanied by some pain.

Married nine years and never pregnant before. Three years ago she underwent an operation on the cervix for sterility. Last menstruation September 16 (three months ago). She has suffered from a moderate amount of nausea and slight vomiting. No headache. No constipation. Physical examination shows patient of moderate height and weight, well nourished, and of good color. She has a well compensated mitral regurgitation. Lungs normal. Pelvic measurement normal. Blood pressure 128/80. *Urinalysis:* Amber in color; clear; acid reaction; sp. gr., 1.020; no albumin or glucose; no sediment. Vaginal examination confirmed the diagnosis of pregnancy. With the exception of some digestive disturbance, the patient, objectively and subjectively, was quite normal until April 26, four months after her first visit; and in the seventh month of her pregnancy, the urine showed a good trace of albumin, a moderate number of leucocytes, and a few red blood cells. The blood pressure was 122/78, and her only complaint, at this time, was excessive "heartburn." A simple antacid mixture was prescribed and the proteins in her diet much reduced.

For four weeks the urine examinations were about the same, viz., a trace of albumin, a few leucocytes and red blood cells; but she developed an almost intolerable general pruritus and insomnia. She had neither headache, nausea, nor epigastric pain.

On May 31, five weeks after the first appearance of albuminuria, the systolic blood pressure rose to 142, and the urinalysis showed smoky color; acid reaction; sp. gr. 1.019; albumin, 2 per cent; sediment contained a preponderance of red blood cells; no casts; no renal cells.

Her confinement to bed and the milk diet, begun four days before, were continued. Three days later a more complete urinalysis showed a smoky specimen; total solids low, 21.4 gm.; urea low, 4.6 gm.; trace of albumin; many red blood cells; no casts.

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[1]Wing, L. A.: Report on Two Cases of Accidental Hemorrhage, Bulletin Lying-In Hospital, City of New York, April, 1916, p. 162.

[2]Quigley, J. K.: Accidental Hemorrhage and Its Treatment, New York State Jour. Med., November, 1916.

June 10, she developed slight edema of the ankles, and the systolic blood pressure rose to 160. At times the urine was quite red and smoky. During the next fortnight her blood pressure remained high; but the hematuria and albuminuria gradually diminished.

There were at no time symptoms of toxemia beyond the insomnia and pruritus. A failure to more thoroughly analyze this case by cystoscopy, blood chemistry, and renal function test was due to the fact that the patient was near term, and because after rest in bed and regulation of diet the hematuria cleared up and never returned.

On June 25 she went into labor. After nine hours of severe pains, I found a fully dilated cervix, head floating above the inlet and a tonically contracted uterus. Because of this, and a history of ten years' sterility, and great desire for a living child, Cesarean section was offered as the safest delivery. This was accepted by the patient and the operation performed. Her convalescence was uneventful; the blood pressure fell to very near normal, and the albumin disappeared.

Of the various causes offered for hematuria, and for hematuria in pregnancy in particular, it seems to me that the most plausible etiologic factor in this case was a toxemia, as evidenced by increased blood pressure and edema.

SPLENIC LEUCEMIA ASSOCIATED WITH PREGNANCY

By Geo. W. Kosmak, M.D., F.A.C.S., New York, N. Y.

LEUCEMIA is defined by Delafield and Prudden[1] as a disease in which the characteristic changes are an alteration in the relative proportions of the different leucocytes of the blood with, usually, an increase in their number, and the appearance of certain forms not seen in the circulation under normal conditions. The red cells are diminished in number and abnormal in form. Accompanying these alterations in the circulating blood are changes in the bone-marrow, spleen and lymph nodes.

Leucemia is usually classified in four types which are determined by fairly well defined clinical and morphological characteristics. These four types are designed as acute and chronic lymphatic leucemia, and acute and chronic myelogenous or splenomedullary leucemia. The latter type we find, in very rare instances, associated with pregnancy; but whether any direct connection exists is still undetermined. Obstetric text books afford us very little satisfaction. Aside from the general statement that the disease occurs and is made worse during pregnancy, no further information is presented. Most authors regard it as a rare complication, and only a comparatively small number of cases have been described.

It is unnecessary in this paper to consider in detail the signs and symptoms of leucemia. The essential point in the diagnosis is the occurrence of a very great increase in the leucocytes, not at all uncommonly up to 200,000, or more. The large number of myelocytes, from 30 to 50 per cent of all the leucocytes present, serves to distinguish the splenomedullary from the lymphatic type of the disease. In the latter the striking feature is the enormous relative increase in the small lymphocytes, often from 90 to 95 per cent, the myelocytes, on the other hand, being very scanty.

The occurrence in the writer's experience within a comparatively short interval of time of two well developed and subsequently fatal cases of leucemia associated with pregnancy, has prompted the brief clinical study of the subject herewith presented. Before proceeding with the recital of cases, a review of the literature may be of interest. No satisfactory references to this subject antedate the year 1888, and since then scattered cases have been reported totalling only about twenty.

J. Whitridge Williams[2] comments on the rarity of leucemia as a complication of pregnancy and advocates termination of the latter in

serious cases, as good results have been known to follow this course. He refers to the statistics of Hermann and Schroeder.

Edgar[3] states that women affected with leucemia seldom become pregnant and in the few recorded cases the infant was sound.

Other standard textbooks either fail to mention the complication or dismiss the subject in a similar fashion. An examination of the journal literature affords us good descriptions of several cases, but leaves no doubt of its rarity.

In an analysis of 60,000 labors occurring in the service of the New York Lying-in Hospital during a period of twenty years, from 1890 to 1910, J. W. Markoe[4] does not include a single case of leucemia complicating pregnancy and diagnosticated as such.

A single case of Hodgkin's disease or pseudoleucemia occurring in this institution was published by A. B. Davis[5] in which the characteristic pathologic changes were present. The patient died about three months after delivery and autopsy confirmed the diagnosis. The blood examinations in this case showed the usual picture associated with this disease without any evidence of the characteristic leucocytosis associated with true leucemia.

Another case of interest in this connection is the report of a successful splenectomy by Dr. A. B. Davis[6] in which the enlarged and wandering spleen found, was probably due to a long standing malarial infection and no characteristic leucocytosis was present.

Of the undoubted cases of true leucemia complicating pregnancy, the first mentioned is that of Greene,[7] of which the original reference unfortunately has not been accessible. The reports which have been obtainable include the following cases arranged chronologically:

J. C. Cameron.[8] Patient aged thirty-six; para vii; seen in the seventh month of her pregnancy with a history of having been under treatment for leucemia for the previous year. A tumor had developed in the left hypochondrium during the sixth pregnancy. Children all normal. Patient had been losing flesh for three years, with occasional attacks of icterus. She was delivered spontaneously of a four and one-half pound child, which was apparently well, in good condition, but died on the fourth day. Autopsy on baby negative as to leucemia. Blood counts practically normal; no leucocytosis. Mother's blood showed the characteristic changes.

The point of interest in this case is the hereditary tendency as a possible factor in the disease. The grandmother and mother apparently had symptoms pointing to leucemia. Two of her children developed leucemia and all had attacks of jaundice at intervals. The most marked symptoms, namely edema and dyspnea, rapidly subsided after labor and the disease ran an apparently chronic course. In this case three recurrent pregnancies took place after the splenic enlargement was noted. Disastrous effects on the nursing child were noted; but the case seems to show that a leucemic mother can bear a nonleucemic child.

In a subsequent paper[9] the author presents a supplementary report on this case. The patient again became pregnant[8] with exacerbation of symptoms, including edema, dyspnea, loss of weight, and weakness. She went to term and had a rapid delivery, with slight bleeding, which was followed by early relief of symptoms. The child suffered from malnutrition and died during the fifth month. Convalescence of the mother was slow. Menstruation returned, but was painful and the dizziness and dyspnea remained. The patient again became pregnant[9] and was made much worse; so that labor was induced at the seventh month. The woman almost collapsed during the delivery of a dead and poorly nourished fetus. The recovery was very slow, and the spleen remained large. In this case the leucemia of the mother did not prevent a recurrence of pregnancy or limit its frequency.

W. W. Jaggard:[10] Patient thirty-four years of age, para vi. Regular menstrual history. Family and past history negative. Had five full-term, normal, and one premature, deliveries. Labors quick and easy. A rapidly growing tumor in left hypochondrium began eight weeks after the last labor and was accompanied by rapid loss in weight and marked malaise. Blood showed characteristic picture of the splenomedullary type of leucemia with a ratio of white to red cells as 1 to 2.7; hemoglobin about 50 per cent. Emaciation progressed rapidly, and was accompanied by severe abdominal pains and edema of the extremities. Death supervened eleven months after labor. No autopsy. The writer believes that the disease began during the sixth month of pregnancy at the time when the blood glandular organs are most affected by the influence of gestation.

Stillman (included in a report by Jaggard): Patient para iv, age thirty-four years; apparently went through one pregnancy with a healthy child and recovered, but died one month after the last confinement. A diagnosis of splenomedullary leucemia was made, but no further details of the case are presented.

Hilbert:[11] Patient age thirty-seven years; para viii; previously well. During the eighth month of her last pregnancy she suddenly developed severe headaches, general weakness with slight rise of temperature and, several weeks later, an extensive sloughing of the mucous membrane of the gums. Blood examination showed a leucemia. Characteristic petechial spots appeared. Spontaneous labor resulted in the birth of a macerated fetus. Very slight bleeding, followed by collapse and death in ten hours postpartum. Autopsy showed a medullary leucemia with the spleen and lymph glands slightly enlarged. Cultures sterile. The author distinguished in this case a prodromal stage, lasting five weeks, followed by the true leucemic period which ended fatally. He thinks the gingivitis quite diagnostic.

C. E. Laubenburg:[12] Patient thirty-two years of age; very anemic; history of three previous miscarriages. Family history good. Menstrual history normal. Six living healthy children. A gradual decline in health during the previous six or seven years was noted, marked by weakness, malaise, cardiac distress, dyspnea, and edema of the extremities. This condition was usually worse during her pregnancies, but improved after labor. The three miscarriages were not accompanied by severe hemorrhages. A gradually increasing mass had been observed in the left side of the abdomen which, on admission to the hospital during her tenth pregnancy, extended downward to the fundus of the five months' uterus. Blood examination showed characteristic leucemia. A spontaneous labor occurred with the birth of a macerated five months' fetus. The patient went into coma during labor with marked dyspnea and rapidly progressing pulmonary edema, followed by death forty

hours after delivery. The diagnosis was confirmed by autopsy; the splenomedullary type of the disease being present. Extensive bacterial cultures were negative.

This case with those of Sänger, Cameron and Green are the only ones reported in which pregnancy occurred repeatedly in a woman already sick with leucemia.

H. Schröder:[13] Patient twenty-five years of age; always sickly. Had five labors and two miscarriages in a period of seven years. Labor spontaneous; one living child; others died at varying intervals from intercurrent diseases. No suspicion of blood disorder, although the patient noticed a splenic enlargement after her fifth labor. During the sixth pregnancy her previously noted symptoms of dyspnea, malaise, weakness, loss of weight, etc., grew worse and, when admitted to the hospital in the sixth month, blood examination showed the characteristic picture of splenic leucemia. Labor induced with delivery of a recently dead six months' fetus. No marked improvement followed. Autopsy on the child negative.

In this case the patient probably went through a full term pregnancy during the period in which her leucemia was already developed and after the second pregnancy, notwithstanding the induction of labor, no marked improvement resulted.

Hermann,[14] reported a case of leucemia at a meeting of the London Obstetrical Society and included in the paper were references to twelve cases published elsewhere. He found only eight cases sufficiently described from which to draw conclusions to the mutual influences of pregnancy and leucemia. Dr. Hermann concluded that the termination of pregnancy was indicated whenever the diagnosis of leucemia was made.

Melinkow and Zomakion[15] report 15 cases from the literature, including one personal case. This patient presented a leucocyte count of 220,000 and had been under treatment for a long time with the x-rays. Labor normal with slight atonic hemorrhage. During pregnancy the hemoglobin content sank from 65 to 45 per cent, red cells from 4,000,000 to 280,000. During the puerperium the hemoglobin sank to 21 per cent, red cells to 180,000. Microscopic examination of the placenta showed that the vessels of the fetal villi contained normal blood; that in the intervillous spaces were leucemic to a high degree, showing a complete anatomic separation between the two bloods. (Original not accessible, no details.)

Thaler:[16] Patient forty years of age; para ix; near term; developed an acute febrile angina followed by epistaxis and anemia. Labor with a dead fetus which, at autopsy, was found to have a hydrothorax, numerous ecchymoses, renal congestion, etc., but no evidence of leucemia. The mother's blood count at the time of labor showed 2,055,000 red cells, color index 0.87, 175,000 leucocytes. The author considers the disease in his case to have been due to the influence of an unknown toxin on predisposed abnormal blood-forming organs.

Peterson[17] reports the following well studied case which was fatal a few hours after labor. A primipara, age 24, gave a history of marked anemia extending over a period of seven years. She was admitted to the Breslau Maternity as the first case of leucemia in about 20,000 labor cases. At the time she was about seven and one-half months' pregnant, extremely anemic and with enlargement of both liver and spleen. The blood examinations seemed to contradict the diagnosis of leucemia based on other symptoms. The red cells, 1,800,000; no increase in the white cells noted; hemoglobin 25 per cent. Picture resembled that of a severe secondary anemia. A rapid spontaneous labor took place and a healthy vigorous child with normal placenta was delivered, the process lasting about eight hours. An hour and a half

later the woman went into sudden collapse without any response to treatment. Autopsy showed a marked anemia of all the internal organs with no lymph-node enlargement. Sections of liver, spleen and bone-marrow showed undoubted myelogenous leucemia in which the suddenly developing acute exacerbation during pregnancy in a predisposed person did not permit of sufficient time for the invasion of the circulation by the characteristic new cell forms.

PERSONAL CASES

CASE 1.—Mrs. A. L.; Italian; para iii; two children alive and well. Admitted to the Lying-in Hospital February 3, 1920, with a history of having last menstruated three months previously. Her physician had been taking care of her for the past month for a dyspnea which began about three months previously and was getting progressively worse. An edema of the legs had been coming on gradually, which was always worse in the evening. The patient complained of constipation. Examination on admission showed a well-nourished middle-aged woman, acutely ill, presenting a condition of moderate dyspnea, edema of the lower extremities, with no cyanosis, jaundice or rash. A marked odor of acetone in the breath was noticed. The tongue was coated; lips dry; lungs negative; heart slightly enlarged with the apex beat in the sixth interspace. Pulse 120. A faint systolic murmur at the apex was transmitted to the back. The abdomen was markedly distended so that no masses or areas of tenderness could be determined. No vaginal examination was made. During the night, after admission, the patient seemed in fair condition and apparently rational. Her general condition became worse towards morning. The pulse increased to 180, was of poor quality, and an examination of the chest at this time seemed to show a beginning pulmonary edema. No response to stimulating treatment noted. The patient began to vomit without apparent cause and then rapidly grew worse, dying at 10 A.M. February 4th, without regaining consciousness. The blood count showed a marked anemia and in addition a very high leucocyte count, 472,000; red cells, 1,090,000; hemoglobin 20 per cent; color index 0.2; polynuclears 5 per cent; small lymphocytes 88 per cent; large lymphocytes 9 per cent. Diagnosis of acute lymphatic leucemia was made. Urine examination negative. Abortion was indicated in this case and was to have been done the morning after admission, but the rapid progress of the symptoms terminated in a fatal issue before the uterus could be emptied. No clue was at hand of the patient's previous condition which, from the statement of her doctor, seemed to be quite normal. Her general appearance and good nutrition did not point to the presence of the disease for any considerable length of time.

The single blood count shows such a preponderance in the proportion of small lymphocytes, about 88 per cent with a total white cell count of 472,000, that one is inclined to regard this case as one of lymphatic leucemia, in contrast to the more commonly reported splenomedullary form. Unfortunately the rapidly progressing illness and failure to obtain an autopsy prevented a satisfactory diagnosis. No enlarged lymphatic glands were noted and the abdominal distention interfered with palpation of the spleen. It is possible that we had here an instance of the so-called mixed leucemia.

Comment.—This case demonstrates a rapidly progressing illness apparently coincident with the development of the pregnancy.

CASE 2.—Mrs. Lily D.; para iv; age thirty-five; Russian; admitted to the Lying-in Hospital, March 31, 1920. Patient gave a history of three normal deliveries, the last three and one-half years ago. The family history was negative in so far as could be ascertained. The patient had always been in good health; no definite history

of previous illness until after the birth of the last child. Since then she noticed a shortness of breath on slight exertion and was told she had heart trouble. Menstrual history apparently normal. Her last period began October 29, 1919. She stated that she felt sick soon after her pregnancy began, presenting a series of indefinite complaints, the most marked being dyspnea and weakness. She was referred to the hospital with a diagnosis of endocarditis, and the suggestion that the uterus be emptied.

Physicial examination on admission showed a moderately well nourished woman with subcutaneous fat slightly developed; complexion rather pale and sallow; marked dyspnea present.

The heart showed a systolic murmur at the fourth interspace, transmitted to the left. An increased fremitus was noted over the apex of the right lung with harsh breathing over the left lung and signs of fluid at the base of the right lung. There was no edema or varicosities of the extremities. The abdomen was soft, thin-walled, and presented an area of moderate tenderness and swelling over the left hypochondrium extending downward. The globular, movable uterus reached about half way to the umbilicus. The blood examination, after admission, showed a marked anemia with greatly increased leucocyte count. A diagnosis of acute leucemia being made, probably of the splenomedullary type. The urine showed traces of albumen and a few granular casts. The patient's general condition seemed to grow rapidly worse after admission to the hospital. The dyspnea was marked, even when sitting up; the pulse was rather weak and irregular. The abdomen became considerably distended and slight elevations of temperature were present. Induction of abortion was done on April 4th, with a medium size Voorhees' bag, and a small living fetus of about five months' size delivered within a few hours. After labor the patient's condition grew worse. She was troubled with a continuous cough and expectorated abundant thick white mucus. The abdominal distention continued and did not respond satisfactorily to the usual treatment with irrigations, enemata, etc. Stimulation with digitalis and strychnia failed. The patient grew steadily weaker, was unable to take nourishment, became more cyanotic and, finally, sank into a condition of coma in which she died, April 18, about two weeks after delivery. Another blood count made April 7 showed a further diminution in the red cells and coloring matter with an increase in the leucocytes. The details of the blood and urine examinations follow:

April 2. Erythrocytes 3,350,000; hemoglobin 65 per cent; color index 0.9; leucocytes 106,000; polynuclears 8 per cent; small lymphocytes 11 per cent; large lymphocytes 81 per cent.

April 7. Erythrocytes 2,820,000; hemoglobin 55 per cent; leucocytes 120,000; color index 0.9; polynuclear 5 per cent; small lymphocytes 10 per cent; large lymphocytes 85 per cent.

Urine Examination.—Specific gravity 1.020-1.030; small amount of pus; trace of albumin; few granular casts; abundant urates.

Comment.—In addition to the blood condition, this patient presented undoubted evidences of cardiac and pulmonary disease; but the leucemia may be regarded as the terminal condition. The rapid progress of the illness during the pregnancy seems to point to a decided influence of this process on the blood dyscrasia. Nothing in the family or personal history, in so far as this could be obtained, was of note. Her other children were perfectly well. The premature fetus was alive at the time of delivery and normal. Wassermann was negative. No autopsy permitted.

SUMMARY

A survey of the reported cases of leucemia complicating pregnancy in which a fairly definite diagnosis from the blood picture was made discloses a total of 12 cases, including two of the writer. The ages of the patients varied from twenty-four to forty; the majority being between thirty-two and thirty-six. With the exception of Peterson's case, all were multiparæ. A possible hereditary history is mentioned in only one case. The parity varied from three to nine. In most of the cases we get a history of living children that showed no tendency to the disease up to the time of the report but, in a few instances, we are told that the babies died at varying periods from a few days to five months, after labor. In four cases mention is made of the birth of macerated or stillborn fetuses. Among twelve cases the mother survived in but two, but how long these mothers lived is not stated, neither is the subsequent course of the disease given. In the majority of cases we find that the woman survived but a short time after labor. One of the writer's patients died before delivery took place. In Peterson's case death came on an hour after labor; in Hilbert's case death took place in ten hours, and in Laubenburg's case death occurred forty hours after labor. There is a record of death in Stillman's case one month after delivery; my second case died in two weeks, and Jaggard's case died eleven months after delivery. In every instance but one (my own case) in which the definite diagnosis is presented, the splenomedullary type of the disease was observed. It will be noted that in many cases the authors mention a prodromal period in which progressive emaciation, anemia, and loss of strength were noted soon after pregnancy, from which no recovery resulted and during which period the woman again became pregnant. The leucemia itself does not therefore appear to be a deterrent factor to conception.

Although the presence of a true leucemia as a complication of pregnancy is from all available records a very rare condition, nevertheless we ought to be on our guard against it. Probably a considerable number of cases of marked anemia in which no satisfactory blood count has been made may have been true instances of this disease. In any case where an anemic patient fails to recover under proper treatment, a more minute and detailed examination of her blood should be made with reference to the possible diagnosis of leucemia. The occurrence of pregnancy in this disease indicates a most unfavorable outlook for the mother and conception must, therefore, not be allowed to take place where the condition is suspected. The prognosis is undoubtedly worse in the pregnant than in the nonpregnant state; and whether the association is accidental or not, is immaterial. Where the disease is already present abortion seems to be indicated, with a rapidly progressing course and a fatal issue. The presence of an enlarged spleen is an almost constant factor in the disease and should lead one to look

for this sign in every anemic patient. The value of the x-ray in leucemia has been brought forward; but, in the event of a pregnancy, its application as a cure for the disease may work an undoubted harm on the fetus and the induction of labor should be done before radiation is begun.

It is necessary to distinguish between the acute and chronic forms of leucemia. Pregnant women may contract a rapidly fatal leucemia if we are to believe the evidence of the cases thus far reported, although it seems possible that the disease was present in a milder form in many of these patients before their last and usually fatal pregnancy occurred. It will be noted that there are apparently cases of chronic leucemia in this series in which pregnancy and labor occurred, and for this reason conservative treatment has been advised under such circumstances. In view of the rapidly fatal ending during the puerperium it would appear that this advice is not justifiable and that in order to avoid such an outcome labor had better be induced in all cases.

REFERENCES

1Delafield and Prudden: A Text Book of Pathology, ed. 11, New York, 1919, William Wood & Company.
2Williams, J. W.: Obstetrics, ed. 4, New York, 1917, D. Appleton & Company.
3Edgar: The Practice of Obstetrics, ed. 5, Philadelphia, 1916, P. Blakiston's Son & Co.
4Markoe, J. W.: Bull, Lying-in Hospital, New York, December, 1909, vi, No. 3.
5Davis, A. B.: Bull. Lying-in Hospital, New York, June, 1908, vii, No. i.
7Greene: New York Med. Jour., 1888, xlvii, No. 6.
8Cameron: Am. Jour. Med. Sc., 1888, xcv, 28.
9Cameron: Am. Jour. Med. Sc., 1890, c, 479.
10Jaggard: Philadelphia Med. News, July 19, 1890, lvii, No. 3.
11Hilbert: Deutsch. Med. Wchnschr., 1893, xxxvi, 875.
12Laubenburg: Arch. f. Gynäk., 1891, xl, 419.
13Schröder: Arch. f. Gynäk., 1898, lvii, 26.
14Herman: Lancet, London, October 12, 1901.
15Melinkow and Zomakion: Russki Wratsch., 1913, Nos. 9 and 10. Abstracted in Jahresbericht, xxvii, 1913.
16Thaler: Zentralbl. f. Gynäk., 1914, No. 29, p. 1029.
17Peterson: Arch. f. Gynäk., ciii, 272.

Owing to war interruptions, much of the recent Continental literature was not available for reference.

DISCUSSION

DR. WILLIAM M. BROWN, ROCHESTER, NEW YORK.—In all of the cases reported by Dr. Kosmak I take it that the life of the child was of very little value, on account of its prematurity. Why delay radiation, because apparently delivery hastened the end or exaggerated the condition? Why not disregard the child *in utero* and get the benefit of the radiation if there is benefit, and take care of the contents of the uterus afterward if you can improve the patient before you empty the uterus?

DR. JAMES E. DAVIS, DETROIT, MICHIGAN.—It would seem that if one viewed this disease, according to the fundamentals that underlie malignancy, the condition ought to be improved under pregnant conditions, excepting that there is a greater call upon the blood elements. A parallel between a leucemia and any malignancy of tissue is very close, and many pathologists place the leucemias in the class of malignant disease. You have cells that have deviated from

the normal proportions, to each other, cells that have become anaplastic; that are perverted from their normal condition, and there is the same general physiologic effect upon the body as we find in the fixed tissue malignancies. I cannot see why there is any advantage in bringing on a delivery or an abortion. I have no doubt that all of these cases begin before the pregnancy and because during the pregnancy there was a cause for a larger amount of blood, and this being a disease involving fundamentally the hematopoietic organs, the call involved exhaustion of these organs before pregnancy could be completed. As I have said, I cannot possibly see any therapeutic value in terminating the pregnancy.

DR. KOSMAK (closing the discussion).—Answering Dr. Brown, I want to say I have had no personal experience with x-rays in cases of this kind, and as to the time of application, I can only reply that few of these women went to term, or they were not brought under observation until they were almost at term. For lack of time details of previously reported cases were not stated, but they are too insufficient in number to formulate any distinct directions as to the course to be pursued. In both of my cases the condition of the patient was so serious that the induction of abortion did contribute to the well-being of these particular women. There is one case reported of three successive pregnancies where the diagnosis was undoubted, and one pregnancy went to the sixth, another to the seventh, and a third one to the eighth month, but there was only one live child out of the three.

In view of the extreme emaciation and distress that most of these patients develop, I cannot see why we should not give them a chance if we can bring about relief by the induction of abortion or premature labor.

You will note in the summary that many of these women gave birth to macerated fetuses. In view of that fact, we can reduce the element of danger by emptying the uterus. There was no difficulty in doing this in one patient I referred to. In this case we put in a bag and in a few hours she was delivered.

I was much interested in Dr. Davis' remarks about the supposed malignant tendency in these cases of leucemia. That has been mentioned several times and undoubtedly there is a good deal of truth in it. In view of that fact, if we assume this is a malignant disease, we ought to pursue the same course we pursue in any other kind of malignancy during pregnancy, namely, empty the uterus. It seems to me, that is the consensus of opinion. What we do in the presence of malignancy in other parts of the body, we should do in that of the blood-forming organs.

I desire above all to call attention to the necessity of thoroughly examining all cases of marked anemia associated with pregnancy. We ought to make a careful white cell count and look for any tendency to leucemia, for many writers have noted a prodromal period marked by progressive emaciation, by dyspnea, etc., in addition to the changed blood.

MISSED ABORTION

By Jennings C. Litzenberg, M.D., F.A.C.S., Minneapolis, Minn.

"MISSED abortion" has not received the consideration in this country that it deserves, being generally considered a rare and unimportant condition, while, as a matter of fact, it is of rather common occurrence and results in invalidism, sometimes of a very serious nature. That this subject is neglected in American medical literature is attested by the fact that of 139 references collected, only ten are American and three of these do not mention the term "missed abortion;" they describe the condition as a rarety and, evidently, have never heard of the term first applied by Matthews Duncan[1] who, undoubtedly, got his idea from Oldham, who in 1847 coined the term "missed labor."

TERMINOLOGY

"Missed labor" was defined as follows: "Protracted pregnancy is the condition of a woman who has passed 278 days and at least a fortnight more than this. If the child dies *in utero* there is not then a "protracted pregnancy;" the woman is in a state of "missed labor." This term has become established by usage since 1847, when Oldham[2] first used it. Duncan[1] in 1878, recognizing the similarity of the condition of a dead fetus *in utero* beyond full term and no labor, known as "missed labor," and the condition of a dead fetus before viability and no effort at expulsion, logically used the terms "missed abortion" and "missed miscarriage." The latter term has fallen into disuse and the term "missed abortion" is now applied to all cases of death of the fetus *in utero* before viability with no effort at expulsion within the usual time of an ordinary abortion.

This naturally brings up the query: When does a woman normally abort after the death of the fetus? Of course the question must be answered more or less arbitrarily. Rhodes[3] says: "The fetus is usually aborted a few days after death," which is, I think, ordinarily not true. Seitz[4] is nearer right when he puts it any time up to four or five weeks.

Inasmuch as constitutional symptoms of any moment are rare in the early stages and the pathologic conditions begin to manifest themselves about the eighth week, I am inclined to place the arbitrary limit of two months after the death of the fetus as the borderline between "abortion" and "missed abortion," which seems quite logical to me because the symptoms of a woman aborting before that time will not vary much from the symptoms of an ordinary abortion.

ETIOLOGY

Etiology must be considered from two standpoints: First; what are the causes of retention or why is the abortion missed? Second; What are the causes of the expulsion after the uterus has lain dormant so long, or why does the secondary abortion occur? At this time we are not discussing the causes of the death of the fetus, but why is it not expelled at the usual time after the demise of the fetus? Lack of irritability of the uterus, which was first suggested by Veit and von Graefe,[26] of course occurs to any one, but why is the uterus unresponsive to whatever irritation it is that causes it to expel a dead ovum?

Liebmann[5] attributes it to central lesions, but this will explain only the occasional case. Scharlaub says it is due to a thin musculature of the organ. Leopold[9] and Stanley Warren[10] claim that it is due to peritonitis, and Menzies,[11] Mueller,[12] Playfair,[13] and Beigel[14] that it is caused by cancer. Sänger[15] claims that fibroids reduce the irritability of the uterus, and that lactation and physical shock may do the same. None of the explanations are satisfactory; but it is easy to accept the theory of lack of irritability of the uterus in spite of the fact that there is little real proof to establish it. Mechanical interference like atresia and stenosis of the os and cervix, (Rissmann,[16] Arthur,[17] and E. Fraenkel[19]); cancer or fibroids of course are easily understandable causes, but aside from these no satisfactory explanation is as yet forthcoming. Why does the secondary abortion occur? Why should a uterus, which has been dormant for weeks and months, suddenly expel its contents, and often with contractions of the greatest violence? The foreign body theory of Orloff,[20] and Ivanoff,[21] is not sufficient, for the foreign body has been present all the time.

The theory of pressure on the internal os and paracervical ganglia is reasonable, because the pressure occurs later on account of the more gradual shrivelling of the ovum and the slower disappearance of the amniotic fluid. But the theory of Ernst Fraenkel,[19] that the returning menstrual function with its consequent congestion causes the bleeding and contractions, is more tenable because it seems to be more effective the longer the time that has elapsed since the death of the fetus and the more the congestion of pregnancy has subsided. (O. Schaeffer.[23])

INCIDENCE

Missed abortion undoubtedly occurs much more frequently than the reports in the literature indicate. I have records of thirteen cases, twelve of which I have seen personally, and one was reported in detail by a former student. I am sure that I saw several cases early in my career when ignorance of the possibility of the condition led me to miss the diagnosis; but as I look back upon them now, I feel sure they were cases of missed abortion. Thirteen cases in one limited experience would not argue very great rarity. Williams,[24] and DeLee,[25]

both believe that it is commoner than usually supposed. Up to 1896 von Graefe[26] collected 70 cases. Ernst Fraenkel,[19] reported several of his own and collected others from the literature, bringing the total number of cases up to 105.

I have consulted 52 references, published since 1903, and have found 75 others which, on account of difficulties brought about by the war, I am unable to secure; so I cannot make a compilation of the number of cases, but from the number of articles it would seem that missed abortion is far from a rare occurrence.

The condition occurs usually in multiparæ. Nassauer asserts that it occurs exclusively in women who have borne children. But this is not true. Only four of my cases were multiparæ, and others have reported similar experiences.

RECURRENCE

In this series Mrs. L. had missed abortions twice within two years, and Machenhauer,[27] also reports recurrence.

MEDICOLEGAL SIGNIFICANCE

When a married woman, in the absence of her husband, expels a fetus corresponding to a development of shorter duration than the husband's absence, which is possible in the event of a missed abortion, unjust suspicion may be cast upon her. Duncan,[1] commenting on this point said: "You cannot say that a woman is pregnant, without misleading, if she is in the condition of missed abortion. Such unfortunate misapprehensions have happened, which shows the importance of counting the term of a woman's pregnancy not, up to the time the fetus was discharged, but back to the time when it died."

TERMINATION

Ultimately the ovum is expelled; but it may be retained for months and even years. One case of retention for twenty-eight years, and another for fifty-two years, found at autopsy, have been reported. The most common termination is maceration with toxemia. Mummification sometimes occurs and, exceptionally, the ovum may be infiltrated with calcium salts and an intrauterine lithopedion is the result. Infection is not a common termination, contrary to experience in ordinary abortions; but if instruments have been used, or the membranes otherwise ruptured, as by frequent coitus, infection may result. Decomposition is common but putrefaction rare. The unrecognized missed abortion is sometimes brought to light by the appearance of an inexplicable sepsis months after the death of the fetus.

Polano,[28] and Ludwig Fraenkel, assert the possibility of complete resorption of the entire ovum. I have seen the entire disappearance of the embryo in an otherwise intact ovum. Absorption cannot take

place after the tenth or twelfth week (Edgar). Skeletization is a very interesting termination in which the bones of the fetus with none, or very little of the soft parts attached, are found within the uterus. Rosenkranz,[22] reports a case in which he found the bones only of a four months' fetus.

PATHOLOGY

In my cases hemorrhage was a prominent finding, giving the ovum the appearance of a hematoma mole; but hemorrhage may be entirely absent. In the placenta infarcts are numerous, sometimes occupying nearly the whole organ, suggesting the probable cause of death of the fetus. Degeneration of various kinds and grades is the rule. Ohlbaum[31] found fatty degeneration of the entire ovum. The placental surface may be dry, shrivelled, tough, of a red or whitish yellow, or waxy appearance.

One of the great dangers of missed abortion is due to degeneration of the blood vessel walls which may be so completely destroyed that uncontrollable hemorrhage results. Rosenstein's[32] fatal case died of hemorrhage due to degeneration of the blood vessels and the neighboring uterine wall, which was transformed into a homogeneous mass.

The amount of amniotic fluid present depends on the age of the ovum at death and the length of time it has been retained in the uterus. In one of my cases in which a four months' fetus was expelled after retention for more than a year there was no amniotic fluid; and in another ovum of two months, retained two and a half or three months, the amount of amniotic fluid was apparently normal. Disappearance or marked diminution of the amniotic fluid without rupture of the membranes is the rule. Occasionally a dropsical ovum is observed (Seitz[4]). In cases of retention for any considerable length of time a deposit of connective tissue is nearly always found which may be in an amount sufficient to be called sclerosis of the placenta (Garrigues,[35] Rosenstein[34]).

A very interesting fact is the frequently found discrepancy between the size of the placenta and the fetus, the former being often as large as the placenta of a fetus a month or more older than the one found; this is due to connective tissue increase, hemorrhages into the placenta and that curious true growth of the placenta after the death of the fetus. When the fetus dies, especially in the early weeks, the chorion and decidua may go on growing because they are nourished by the maternal blood circulating in the intervillous spaces which may continue for a long time. La Verge[6] observed karyokinesis indicating cell multiplication rather than hypertrophy. The Langhans or inner layer of the villous epithelium, which is not in direct contact with maternal blood, is an early victim to coagulation necrosis; but the outer syncytial layer, bathed in maternal blood, is preserved much longer until throm-

bosis takes place, shutting off the blood supply to the intervillous spaces.

In the second half of pregnancy von Franque[7] asserts that this interesting phenomenon of continued growth after the death of the fetus does not occur. That the placenta lives and grows, at least in the early months, after the death of the fetus has been proved by Moll,[29] O. Schaeffer,[23] Physalix,[30] Giacomini,[8] von Franque,[7] and LaVerge.[6]

Microscopic studies show all stages of necrosis of tissue, placenta, decidua, amnion, blood vessels, the fetus and even uterine walls. If the ovum remain in the uterus for a long time, drying out or mummification occurs. Calcification with lithopedian formation is rare; but, if maceration occurs in place of the drying out, the soft parts may entirely disappear; there being found only remnants or nothing of the secundines, and only the skeleton of the fetus remains.

SYMPTOMS

Usually, but not always, after the death of the fetus there are signs of an abortion which subside, and the patient and her attendant think that a threatened abortion has been avoided or completed. Weeks or months later the physician is consulted because there is no increase in the size of the uterus or, on account of continued hemorrhage, or the cessation of fetal movements and other subjective signs of pregnancy. Examination shows that the uterus has not grown or has even decreased in size. The patient, not infrequently, has already noticed that the size of the womb is diminishing. The consistency of the uterus is not characteristic of that elastic softness peculiar to pregnancy, neither is it hard like a fibroid but rather between the two.

Regressive changes in the breasts also take place. The patient thinking an abortion has already occurred, or mistaking the occasional hemorrhages for irregular menstruation, seeks the advice of her physician because of her unaccountable invalidism, which has been progressive, and begins usually with malaise, anorexia, "dyspepsia," or headache. This is followed by loss of flesh, chilliness, or even chills, a foul taste in the mouth, and sometimes by a bearing-down weight "like a stone in the abdomen." All of these symptoms increase until she is, indeed, an invalid and her medical attendant finds her a victim of grave anemia out of all proportion to the loss of blood, and an afternoon temperature. In some cases symptoms of mental derangement appear and, occasionally, there may be no symptoms whatever. Ohlbaum[31] reports a case of a woman who carried a three months' fetus for more than six months "without causing any physical disturbance." Case 2 of my series carried a one month fetus for three months with no untoward symptoms.

HEMORRHAGE

Hemorrhage is a very inconstant accompaniment of missed abortion, but in some form or another it usually complicates the condition, some-

times it constitutes a very great danger. However, in some cases, there are no signs of hemorrhage; not even microscopically in the pathologic specimens. When hemorrhage does occur, the first bleeding is like that of a threatened abortion; then it may become intermittent, days, weeks or even months may intervene, or there may be a more or less constant blood-stained discharge varying in amount from time to time. Upon examination, or other manipulation, or at the time of expulsion there may be no bleeding or a violent hemorrhage. Duncan[1] noted the loss of a quart of blood from the introduction of a tent. Rosenstein[32] had a fatal case of bleeding due to degeneration of the blood vessels. The bleeding at expulsion of the ovum or postpartum is sometimes so severe as to threaten the patient's health and life. This is not altogether due to the lack of tone of the uterus but to hyalin degeneration of the blood vessel walls and to infiltration with connective tissue cells rendering contraction impossible.

DIAGNOSIS

The diagnosis is more readily made than the cursory writer would have us believe. More mistakes are made on account of the failure to bear in mind the possibility of the existence of a missed abortion than from the difficulties of making the physical finding. That master teacher of our art, Matthews Duncan,[1] put it very forcibly when he said, "I do not know of any subject better than missed abortion for illustrating the value or necessity of extensive knowledge with a view to good diagnosis. *If you do not know of a thing you are quite sure not to suspect it; and if you do not suspect a thing you are almost certain not to find it.*" Unfortunately there seems to be a lack of knowledge on the part of a considerable percentage of the profession of the possibility of the existence of a missed abortion, therefore it is likely to be overlooked. It was this ignorance, first on my own part and later observed in others, and the woeful paucity of literature on the subject in the United States, that led me to select this subject for discussion.

The diagnosis is not particularly difficult if the possibility of missed abortion is kept in mind. This possibility should be strongly suspected if a woman has skipped one or two menstruations and then had symptoms of threatened abortion, which have subsided, and the size of the uterus does not increase. The lack of growth of the uterus can be determined, even if there be no previous knowledge of the patient, by two examinations made a month apart, or by comparing the size of the uterus with the size it ought to be for the supposed period of gestation. If there be a lack of a combination of symptoms pointing to missed abortion, particularly if toxic symptoms are wanting, it may be wiser to wait even two months between the examinations. The uterus will not be as large as it should be, it will be harder, less elastic, and the other objective signs of pregnancy will be absent or re-

gressing. The irregular bleeding may lead the woman to think she is not pregnant, particularly if her abdomen does not increase in size. The condition may then be mistaken for malignancy. Todd[33] reports a case where an eminent specialist diagnosticated a malignant growth and advised removal of the uterus at once. Any woman of the child-bearing age, who has suppression of the menses, irregular or atypical menstruation, toxic symptoms such as malaise, loss of appetite, chilliness, foul taste in the mouth, anorexia, loss of weight, particularly afternoon temperature, and who is in a general state of invalidism, should always have the possibility of missed abortion excluded before concluding that she has tuberculosis, syphilis, focal infection, or what not.

An instance which well illustrates how missed abortion may be overlooked is the following: Mrs. J., a multipara, skipped two menstruations, then bled irregularly for short periods; at first she thought she was pregnant, then she thought that she was not, interpreting her hemorrhages as irregular menses. She lost her ambition, had no appetite, was anemic and in a generally debilitated condition, and later she developed an afternoon temperature. Her husband, a physician, became worried about her condition and took her to a very good colleague for examination. He pronounced her not pregnant. He then had her examined by an excellent internist who examined her thoroughly, but could not account for the afternoon temperature. All sorts of tests were made, tuberculin, Wassermann, sinus illumination for focal infection, tonsil examination, and x-ray of the teeth, but her condition remained a puzzle. When we were called in, on account of quite a brisk hemorrhage, a diagnosis of missed abortion was made and when the uterus was emptied all the symptoms disappeared at once. Three excellent physicians had missed the diagnosis, not from lack of skill but from the lack of knowledge that "missed abortion" is always a possibility with skipped and irregular menstruation, and obscure invalidism, particularly with an afternoon temperature. Internists should note that missed abortion is a cause of afternoon fever.

PROGNOSIS

The prognosis in this condition is not as favorable as is generally supposed. While most cases, if left to themselves, will finally expel the dead ovum, the dangers of its presence are real. A condition which constantly has the potential danger of hemorrhage, invalidism, which may become permanent, and death, cannot be considered lightly. Duncan's case[1] of excessive hemorrhage illustrates the danger from this source.

My case, No. 5, of prolonged invalidism with ultimate recovery, shows the low state of health to which a woman may descend, but yet be restored after emptying the uterus. Case 7 is an example of a woman in good health up to the time of her missed abortion resulting

in an invalidism from which she never recovered, finally ending in tuberculosis. Rosenstein's fatal case of hemorrhage from degenerated blood vessels illustrates that missed abortion has a definite mortality.

TREATMENT

With this prognosis, expectant treatment cannot be safely prolonged. Rosinski[34] believes the uterus should be emptied immediately and Rosenstein[32] was driven to the same conclusion by his fatal case, going so far as to advise vaginal hysterectomy in cases of long standing. I am thoroughly convinced that missed abortion is a very much more serious condition than is generally supposed and that we are not justified in exposing our patients to the dangers of temporary or permanent ill health, or even death, by allowing missed abortion to go on indefinitely in the hope of a spontaneous termination.

If the ordinary methods of inducing expulsion fail, the cervix should be dilated, the contents removed, and the uterus packed, on account of the tendency to postoperative bleeding. The inexplicable indolence of the uterus, which has caused the retention of the dead ovum, seems to persist, rendering it incapable of contractions. Often the cervix inordinately resists dilatation; if difficulty is met in attempting to dilate the uterus, one should not persist in the attempt but perform a hysterotomy (vaginal Cesarean section) immediately.

CONCLUSIONS

1. Missed abortion is the prolonged retention of a dead fetus *in utero*.
2. It is a common condition.
3. The cause is unknown.
4. The dangers are: (a) Temporary ill health, continuing until the uterus is emptied. (b) Permanent ill health, if allowed to continue too long. (c) Death.
5. Its medicolegal significance is important.
6. Diagnosis made on regressing signs of pregnancy, irregular bleeding and afternoon temperature.
7. Afternoon temperature with any of the above signs is particularly significant.
8. Uterus should be emptied before condition becomes a menace to health.

PERSONAL CASE REPORTS

The cases which I have personally observed I desire to present in abstract as follows:

CASE 1.—Mrs. J., para ii; month of fetal death, second; retention *in utero* after death of fetus, five months; symptoms, invalidism, anemia, hemorrhage. Diagnosis not made before expulsion.

CASE 2.—Mrs. X., para ?; month of fetal death, fourth; retention *in utero*, four months; patient not seen. Diagnosis made from specimen and history.

CASE 3.—Mrs. D., para i; month of fetal death, three and one-half; retention *in utero,* three; symptoms, general invalidism, no bleeding.

CASE 4.—Mrs. C., para i; month of fetal death, third; retention *in utero,* ten months. In this case the diagnosis was not made until the complete ovum was expelled at the end of the thirteenth month.

CASE 5.—Mrs. B., para iii; month of fetal death, first; retention *in utero,* three months. No symptoms.

CASE 6.—Mrs. C., para i; month of fetal death, fifth; retention *in utero,* two months. No symptoms.

CASE 7.—Mrs. T., para i; month of fetal death, fourth; retention *in utero,* three months. Course marked by weakness and afternoon temperature; afterwards developed tuberculosis, possibly favored by the debilitated condition.

CASE 8.—Mrs. L., para v; month of fetal death, fourth; retention *in utero,* three months. Course marked by general debility, loss of weight, anorexia, afternoon temperature. This patient had two "missed abortions" two years apart.

CASE 9.—Mrs. L., para vi; month of fetal death, third; retention *in utero,* four months. (Same as previous case.)

CASE 10.—Mrs. A., para ii; month of fetal death, third; retention *in utero,* four months. Course marked by irregular bleeding, loss of weight, general debility, afternoon temperature.

CASE 11.—Mrs. B., para iv; month of fetal death, second; retention *in utero,* four months. No symptoms.

CASE 12.—Mrs. J., para iii; month of fetal death, fourth; retention *in utero,* four months. Course marked by anorexia, loss of weight, anemia, marked debility.

CASE 13.—Mrs. S., para ii; month of fetal death, fifth; retention *in utero,* three months. Course marked by debility, no temperature.

REFERENCES

[1]Duncan, Matthews: Med. Times and Gaz., 1878, p. 729.
[2]Oldham: Guy's Hosp. Repts., 1847, p. 105.
[3]Rhodes: Am. Jour. Obst., 1910, lxii, p. 683.
[4]Seitz: von Winkel's Handb. d. Geburtsh., ii 1277.
[5]Liebmann: Beitr. z. Geburtsh. u. Gynäk., iii, p. 47.
[6]LaVerge: Frommel's Jahresb., 1899, p. 721.
[7]von Franque: Ztschr. f. Geburtsh. u. Gynäk., xxxvii, p. 377.
[8]Giacomini: Ergeb. der Anat. u. Entwicklungsgesch., Vol. iv.
[9]Leopold, Arch. f. Gynäk., 1876, xi, p. 39.
[10]Warren: Am. Jour. Obst., 1885, p. 704.
[11]Menzies: Glasgow Med. Jour., 1853, i, p. 129.
[12]Mueller: Ztschr. f. Geburtsh. u. Gynäk., xxxvii.
[13]Playfair: Trans. London Obst. Soc., Vol. x, p. 58.
[14]Beigel: Krankheiten der Weib. Geschlechtsorgane, ii, p. 522.
[15]Sänger: Zentralbl. f. Gynäk., 1885, p. 348.
[16]Rissman: Ibid., 1893, p. 285.
[17]Arthur: Ann. Gynec. and Pediat., xii, p. 187.
[18]Kleinertz: Zentrabl. f. Gynäk., 1901, p. 809.
[19]Ernst Fraenkel: Volkmann's Sammlung. Klin. Vortr., March, 1903, No. 351.
[20]Orloff: Ibid., March, 1903, No. 35.
[21]Ivanoff, Zentralbl. f. Gynäk., 1898, p. 1025.
[22]Rosenkranz: Berlin klin. Wchnschr., Jan., 1904.
[23]Schaeffer, O.: Monatschr. f. Geburtsh. u. Gynäk., viii, No. 4, p. 342.
[24]Williams, J. W.: Obstetrics, Fourth Edition, 1 year. p. 342.
[25]De Lee, J. B.: Principles and Practice of Obstetrics, 1918, ed. 3.
[26]von Graefe: Festschr. f. C. Runge, 1896, p. 38.
[27]Machenhauer: Zentralbl. f. Gynäk., 1902, p. 527.
[28]Polano: Zentralbl. f. Gynäk., 1904, p. 448.

[29]Moll: Johns Hopkins Hosp. Rept., ix, 1.
[30]Physalix: Jour. de l'Anat., 1890.
[31]Ohlbaum: New York Med. Rec., 1911, lxxx, 430.
[32]Rosenstein: Monatschr. f. Geburtsh. u. Gynäk., xxxiii, 6.
[33]Todd: New York Med. Jour., 1884, xl, p. 293.
[34]Rosanski: Monatschr. f. Geburtsh. u. Gynäk., 1908, xxviii, p. 131.
[35]Garrigues: Am. Jour. Obst., 1884.
[36]Roush: Lancet-Clinic, 1887. N. S. xix, 607.
[37]Slenker: South Med. Jour., 1913, vi, 659.
[38]Peter, L. C.: Am. Obst. and Gynec. Jour., February, 1899.
[39]Titus: Am. Jour. Obst., 1912, lxv. 965. Reports five cases.
[40]Oliver: New York Med. Jour., 1904, xx, 101.
[41]Fruitnight: Am. Jour. Obst., 1884.

DISCUSSION

DR. OTTO H. SCHWARZ, ST. LOUIS, MISSOURI.—I was particularly interested in hearing what Dr. Litzenberg had to say about the causation of missed abortion because in cases which I have seen, there was some abnormality of the cord.

In the first, which is the most typical case of missed abortion, a woman at full term was delivered of a fetus approximately 16 cm. in length. The uterus in this case had not enlarged since the fourth month of pregnancy, at which time fetal movements were felt for about one month. The cord lesion in this case was a velamentous insertion.

The second case was a pregnancy in which there was no further development after three and one half months, the ovum being expelled six weeks afterwards. In this case the cord was wrapped three times around the neck of the fetus and also had a true knot. The specimen from this case was described by Dr. Fred Taussig.

The third case was remarkable not only on account of the missed abortion, but was also a case of single amnion twin pregnancy with entwining of the umbilical cords. The specimen was expelled from the uterus, apparently the size of a twenty-four weeks' gestation which had not increased in size during the last two months of the pregnancy. No fetal movements had been felt. One fetus was mummified, 17 cm. in length. The other fetus was 10.5 cm. in length and was a monster of the acardiacus acephalous type. These cords were entwined together by many revolutions. There was a true knot in the cord of the larger twin. This specimen was presented by Dr. S. F. Abrams. The placentas in all of these cases microscopically show marked degeneration throughout and a picture similar to that characteristic of white infarct formation.

Another case which might be classified under this group was a pregnancy which went to twenty-eight weeks, after which time fetal movement ceased and the fetal heartbeat could no longer be heard. Four weeks later the fetus was expelled and was macerated. In this instance there was a true knot in the cord.

DR. ABRAHAM J. RONGY, NEW YORK CITY.—Since Fraenkel published a thesis based upon a study of one hundred and five cases of missed abortion, very little has been written on the subject.

Fraenkel's definition of missed abortion as published in 1902 was as follows: A fetus ceasing to grow before viability which was retained in the uterus up to the time when labor was supposed to have taken place. However, since then our conception of the entire subject changed because we are not so fearful of emptying the uterus as they were in those days. There are not so many cases now which are allowed to go on to term. Missed abortion is a very dangerous condition for the woman as has been shown by the case of Dessikar, when after

seven years the fetus perforated the uterus, entered the peritoneal cavity, and the woman died as a result of sepsis.

Personally, I believe that abortion must be divided into three distinct groups. First, the acute variety: A woman who has been pregnant two or three months suddenly gets pain, hemorrhage, and within twenty-four or thirty-six hours the product of conception is expelled. In these cases we find that there is practically very little the matter with the fetus but we do find a clot of blood on the uterine surface of the placenta entirely interrupting the circulation and causing it to become a foreign body and is therefore quickly expelled. Second, the subacute variety: A woman who is pregnant two or three months and stained or spotted for a week or more, at the end of which pain will set in with some hemorrhage and the product of conception is expelled. On examining such products of conception we find that the child has probably been dead for twenty-four or thirty-six hours, that a greater portion of the placental surface is dotted with small hemorrhages and as soon as the largest part of the placental surface is disturbed circulation is interrupted and it naturally becomes a foreign body and the product of conception is expelled. Third, or so-called cases of missed abortion. In these cases we find the condition reversed: A woman has been pregnant for two or three months then some staining or spotting will appear, the uterus ceases to grow, the placental site is not disturbed. Upon examination of the product of conception in these cases we find the fetus shrunk and somewhat decomposed but the placenta is more or less enlarged and is out of proportion to the size of the fetus. Only after complete degeneration of the placental site will the uterus at times expel the product of conception.

My own experience consists of twenty-one cases which I presented to the New York Academy of Medicine last April, since then I have had two more. Hemorrhage was not an important factor in any of the cases, neither was the temperature. On the whole the women seemed to carry the product of conception easily, and were not badly affected by it. The question is what are we to do in cases of missed abortion. Some obstetricians maintain that all such cases should be let alone.

Personally, I believe that when a patient consults a physician and he suspects a missed abortion he ought to keep her under observation and tell her to return for another examination in four weeks and if he finds that the uterus is not enlarged at that time and if she still has signs and symptoms of a retained product of conception, that he should wait four weeks longer in order to make sure of his diagnosis because in many cases the menstrual history does not correspond with the size of the uterus. However, if, after eight weeks' observation he finds that the uterus is not enlarged and has become less soft he ought to interfere. I do not think we ought to wait until the end of the supposed pregnancy before interference is instituted. I think such practice is bad and as a result many women may suffer.

DR. G. VAN AMBER BROWN, DETROIT, MICHIGAN.—I should like to report a case for the purpose of getting it on record. This past spring an internist referred to me a woman with pulmonary tuberculosis. She was sent to me for the purpose of considering the advisability of emptying the uterus. I found she had been pregnant about three months. After further consultation we decided not to empty the uterus. I saw the woman about three months later and was then suspicious of a dead fetus. When she was seven months' pregnant, the uterus upon examination was found to be smaller than when it was first examined. The evening following this examination I was called by the husband to come and see his wife as she was in labor. I arrived in about thirty minutes

and found she had expelled the ovum. The membranes were intact. On opening the membrane it was found to contain a fetus of about thirteen or fifteen weeks. The cord was entwined several times about the neck binding it so tightly that the neck at this point was just about the size of one's little finger. Evidently the death of the fetus had occurred about twelve or fourteen weeks before the expulsion.

DR. LITZENBERG (closing the discussion).—I did not go into the details of etiology because there are so many theories. Dr. Schwarz spoke of lesions of the cord. That is a cause to which our attention has been called by one author. One of my cases was a case of twins. The expulsion of a fetus with another twin does not come within the purview of this paper. Dr. Rongy mentioned Fraenkel's paper in which he collected 105 cases. It was my intention and my hope to make the compilation since that time; I find 52 articles since 1903 on missed abortions, but on account of the conditions of the war I was unable to get anything like a complete collection of the papers themselves. There are to be added to that 75 known cases of articles which I did collect, but inasmuch as the majority of these articles I could not get hold of, I did not go into the question of figures. I have collected 139 articles on the subject to date. Dr. Rongy mentioned a case which came in the skeletization class. If we add to this class the skeletization where the entire fetus, except the bones, disappears, it would make an interesting chapter by itself.

Dr. Rongy spoke of not seeing any hemorrhage. He may never see any, but, on the other hand in the next case, the hemorrhage may be very severe. This has been pointed out by Duncan. Hemorrhage is an inconstant thing, I am sure, but after delivery some of these women bleed profusely.

As for waiting to empty the uterus, I cannot see any logic in waiting for a month, when even in my small series and in the series given in the literature the woman is exposed to temporary invalidism which reduces her to a low state of health. In my case, No. 7, the woman was in perfect health up to the time of the missed abortion and never regained her health. That is probably the reason why tuberculosis was able to fasten itself upon her.

In Rosenstein's and Rosinski's cases there were deaths due to missed abortion. Do not get the idea that emptying the uterus is an urgeut thing, and that we must empty the uterus immediately because we have made a diagnosis. It is not so acute that great hurry is necessary but we must not wait too long. The degeneration may involve the uterine wall, and we may get such a hemorrhage as to cause death, as was the case of hyalin degeneration in Rosenstein's cases. Why expose the woman to such danger when we can empty the uterus with greater safety? I said it was well to empty the uterus, but be sure of the diagnosis. See the woman a month between, and if she has not had any untoward symptoms, I would wait two months, as Dr. Rongy does.

I have written this paper as propaganda. I have been asked by many professional friends: "What is missed abortion?" They have never heard of it. I have told them to read what Duncan has said on the subject: "If you do not know about the thing, you are not likely to suspect it, and if you do not suspect it, you will be sure not to find it."

THROMBOPHLEBITIS DURING THE PUERPERIUM FOLLOWING INFLUENZA, WITH A REPORT OF CASES

By Lewis F. Smead, M.D., Toledo, O.

THE present interest in septic pelvic puerperal thrombophlebitis arose when it was suggested that the pyemia, which makes the disease so serious, might be prevented by surgical intervention. In other fields of surgery, as early as 1784, John Hunter had successfully treated a case of pyemia by ligating the saphenous vein; and in 1884 Zauful had ligated the internal jugular vein for lateral sinus thrombophlebitis. In 1898 Freund suggested that, as in certain cases of fatal puerperal infection the only lesion present was a thrombophlebitis of the spermatic veins, the ligation or excision of these vessels would be a practical operation. Sippel in 1894, and Lusk in 1896, had already suggested hysterectomy with the excision of the thrombosed veins as a method of dealing with the condition. In 1902 Trendelenburg reported the first successful ligation of the pelvic veins for thrombophlebitis, and it was his paper, together with one by Bumm, that stimulated the interest in this subject.

Since the report by Trendelenburg many exhaustive papers have been written on pelvic thrombophlebitis, attempting to establish the diagnosis, determine the indications for operation, and, by comparison of operative and nonoperative results, to decide the question of surgical intervention. As yet, however, the number of operative cases is too small to make a final conclusion possible.

Pelvic thrombophlebitis, following childbirth, is more common than is ordinarily realized. It has been found in from 30 to 50 per cent of cases dying of puerperal infection. There are many reasons why this condition should be frequent in the puerperium. The blood current is slowed in the pelvic veins and in the veins and sinuses of the uterus, because the large vessels of pregnancy have less to do in the puerperium and also because the woman is quiet in bed and is weak and anemic after her delivery. Some of the veins are even filled with clots or thrombosed. This is especially true in a subinvoluted uterus. The increased viscosity of the blood and the high platelet count of pregnancy, also favor thrombosis. The traumatized pelvic veins and the open, torn uterine sinuses are especially susceptible to thrombophlebitis.

The determining factor in thrombophlebitis, however, is the infection which enters, as a rule, through the placental site, but also through tears in the cervix and vagina and, probably, not uncommonly by the general circulation from such foci as infected teeth, tonsils, and air

passages. The infecting organism is nearly always the streptococcus. In general we may speak of two types of puerperal thrombophlebitis: the acutely virulent, rapidly progressing type and a less virulent, subacute, slowly extending one. The acute infection goes rapidly along the interior of the blood vessels as an acute phlebitis. It proceeds more rapidly than the thrombus formation, reaches the general circulation, and quickly produces a fatal septicemia. The subacute infection also extends as a phlebitis, but is preceded by a thrombosis, which delays or blocks its progress. These patients have a better chance than those suffering with the acute variety; however, the mortality is very high. In thrombophlebitis the infection begins in the torn, open, venous sinuses of the placental site and extends through the veins of the uterus to the pelvic veins, whence it goes by the ovarian, uterine, median, or smaller veins to the vena cava and general circulation. In the less virulent cases the infection is delayed or entirely blocked by the thrombus formation, which has preceded the infection and is in this case a conservative process.

In a large percentage of cases, however, the infection works by the softening thrombus and, along with bits of the thrombus, escapes into the circulation, producing rapid rises in temperature, chills, and metastatic foci in the lungs and other organs. Strangely, however, massive, suddenly fatal, pulmonary emboli are rare in puerperal thrombophlebitis. Later in the course of the disease the infection breaks through the vessel walls, producing a perivascular lymphangitis and not infrequently a localized collection of pus. Abscess formation within the walls of the uterus is also a common complication.

The clinical picture of uncomplicated, pelvic thrombophlebitis is quite characteristic. The temperature is the most reliable symptom. As in lateral sinus infection, it rises suddenly from normal to 105°F or 106°F and, in a short time, falls to slightly above or below normal, where it remains until the next sudden rise. During the high temperature the patient looks flushed and ill, but during the remission it is hard to believe that she is not entirely well.

The characteristic temperature is frequently preceded, for a few days, by a low grade fever.

Severe, prolonged chills are present in the majority of cases. Not infrequently, however, they are few or entirely absent. Their early appearance is supposed to indicate a grave prognosis. Their disappearance is said to indicate an early recovery. Fatal cases, however, may occur without any chills.

The pulse rate fluctuates with the temperature, but is relatively low until the patient begins to suffer from severe sepsis, the result of the development of metastatic foci or of extensive abscess formation about the veins or of septicemia.

The blood cultures are as often negative as positive.* Cultures taken near the time of a chill or sudden rise of temperature are more often positive. The occasional negative or positive blood culture is not of prognostic value; however, the constant presence of a positive culture is of serious moment.

The prolonged course of this disease, lasting for months, is quite characteristic. Even without complications it may last for many weeks. The onset of the symptoms typical of thrombophlebitis may be within the first few days after delivery, but it is more often early in the second week.

In phlebitis of the pelvic veins pain is usually absent. Slight tenderness about the involved veins is the rule. When the infection breaks through the vein walls, pain and tenderness are of course present. The thrombosed vessels can usually be palpated at some stage of the disease. This is especially true when the uterine veins are the seat of trouble.

When the ovarian veins are involved, they frequently cannot be palpated. In the early, acute cases the thrombosed veins can less often be discovered. In the early stages of thrombophlebitis the uterus is usually subinvoluted, and there may be some abnormal discharge in which the streptococcus is commonly found. Later, in the chronic cases, the uterus is small and firm. Aside from some edema on the side involved, the tubes and ovaries are normal. Peritoneal symptoms, if present, are due to the complications or sequelæ of thrombophlebitis, not to the disease itself. Retrograde involvement of the femoral veins, with swelling of the legs, is a sign of extensive involvement and usually indicates a hopeless condition.

Many men question whether there is a symptom complex by which pelvic-thrombophlebitis can be diagnosticated with reasonable accuracy. The extensively fluctuating, hectic temperature, frequent, severe chills, sharply defined, slightly tender masses in the region of the pelvic veins are convincing evidence of thrombophlebitis. Even if the chills are absent and no thrombosed vessels are palpable, yet the peculiar temperature and the patient's unusually normal condition between temperature rises are very suggestive symptoms, if the uterus and adnexa are free from inflammation. The prolonged course of the disease is also very characteristic.

In septicæmia the temperature fluctuates less, chills are not so common, the patient appears ill all the time, the pulse is higher, and blood cultures are more constantly positive. In pelvic lymphangitis the induration is more extensive, not sharply defined, and very tender and painful. The course of the disease is less chronic, and the mortality relatively low. A small area of lymphangitis of a chronic type is difficult to distinguish from a group of thrombosed pelvic veins.

A puerperal thrombophlebitis in the veins outside of the pelvis is indistinguishable from the same condition in the pelvic veins, so far as

symptoms are concerned. Not infrequently an infection passes by the pelvic veins and involves the iliac veins or the vena cava, primarily, just as it does so commonly the femoral vessels.

The prognosis in puerperal thrombophlebitis is not good. In the nonoperative cases the mortality is estimated from 50 to 100 per cent. Sanes gives it as 51.6 and Brettauer as 47.5 per cent. Miller gives the gross mortality of the operative cases as 51.6 per cent and the corrected mortality, after leaving out the perfectly hopeless cases that never should have been operated, as 33.9 per cent. Williams thinks that early cases, involving the ovarian vein alone, should not give an operative mortality of more than 10 per cent.

Undoubtedly, if we perfect our means of diagnosis and are on the lookout for these cases, we will not only get them earlier, but we will recognize some of the milder ones. This will improve the mortality rate of the nonoperative cases as well as the operative. It is not quite fair, it seems to me, to charge all the advanced, severe cases of the past to the nonoperative mortality record and to correct the operative record by omitting all the bad cases and including the early and mild ones. Interest in the treatment of septic puerperal thrombophlebitis has been chiefly surgical since 1902.

Prophylaxis consists of intelligent, modern obstetrics, with careful asepsis, complete evacuation of the uterus, good drainage, a minimum amount of traumatism, and as little hemorrhage as possible. In the puerperium it is important that the circulation be kept as active as possible by good food, fresh air, heart stimulation if necessary, and getting the patient out of bed as early as is reasonable.

The nonsurgical treatment consists in general measures to keep up the body resistance, good food, abundance of fresh air, and the avoidance of anything which may dislodge the thrombus—such as douches, enemata, and pelvic examinations. Vaccine and serum treatment has been disappointing.

The surgical treatment has consisted in the ligation or excision of the involved veins and in the drainage of perivascular abscesses. The transperitoneal route has proved better than the extraperitoneal or vaginal approach. The question of whether to ligate or to excise the involved veins has been more difficult for the profession to decide. Opinion, however, seems in favor of ligation, unless rupture of a vein filled with pus seems likely or perivascular abscess actually exists. Excision or simple drainage then is advocated. In thrombophlebitis of the internal iliacs or median iliac veins, ligation is the only procedure anatomically possible; but with the ovarians either excision or ligation can be done. If the operation is performed early in the disease, when other vessels are likely to become involved, all the cardinal veins must be ligated. In the late stages of the more chronic form of the disease one may be content to ligate only the vessels on the side diseased.

Baldwin, with excellent results, has done complete hysterectomy for thrombophlebitis of the pelvic veins. He ligated the arteries only, left the proximal ends of the veins open for drainage, filled the pelvis with gauze, and drained by the vagina. His cases were desperate ones, containing abscesses in the uterine walls. The profession has not accepted hysterectomy in the treatment of simple thrombophlebitis of the pelvic veins, but in cases with abscesses in the uterine walls should be carefully considered.

The common iliac veins and even the vena cava have been successfully ligated and without giving rise to gangrene or even much edema. Most of the patients, however, died because the infective process could not be stopped, but they lived long enough to prove the ligation itself not to be so serious.

Those who favor the surgical treatment of thrombophlebitis assert that an accurate diagnosis can be made, that in the early cases the pathology is limited to one side of the pelvis and even to one ovarian vein in many cases, that ligation does arrest the progress of the disease if not too far advanced, that the operation at least does no harm, that the nonoperative mortality of 52 per cent can be reduced to 30 per cent or less by operation, and that a long, exhausting illness can be avoided.

Those who are opposed to major surgery in thrombophlebitis argue that the diagnosis is not accurate, that usually the disease cannot be recognized until cure by operation is impossible, that interference in early cases will result in many unnecessary operations, that ligation frequently does not arrest the disease even in the vein involved, that it is impossible to ligate all veins by which infection may extend, that the disease often involves higher veins without involvement of the pelvic vessels, that fatal metastatic foci may exist at time of operation and be unrecognizable, that any major operation is serious for such patients, that the operative mortality is little less than the nonoperative, that there is serious danger in manipulating such virulent infections, that the thrombosis is a strictly conservative process not to be disturbed.

It is generally agreed that it is useless to operate pelvic thrombophlebitis if serious metastatic foci exist, if there is a constant bacteremia or septicemia, if pelvic cellulitis, marked peritonitis, or extensive perivascular abscesses are found, and especially if the thrombophlebitis has involved the vena cava. It is impossible to say just what cases of thrombophlebitis should be operated, and harder still to choose the best time for operation. The ultra acute cases, certainly, are not suitable for operation. The subacute or chronic cases, however, offer some chance of cure. The number of chills cannot be used as a guide in choosing the time for operation. If, after the first acute onset, the symptoms settle down to a definite, typical course; if there are no serious complications; if the patient is not improving but rather losing, operation

should be considered. However, great conservatism must be the rule in considering a major operation on the infected puerperal woman.

CONCLUSIONS

1. Puerperal pelvic thrombophlebitis is more common than is ordinarily realized.
2. The diagnosis can be fairly accurate.
3. The source of the infection may have a distant as well as a local origin.
4. The results of surgical treatment are probably slightly better than the nonoperative.
5. The indications for operation are difficult to determine.
6. The greatest conservatism must govern the choice of cases for operation.
7. The majority of cases should not be operated.

The following cases were seen in consultation:

CASE 1.—On Jan. 25, 1920, Mrs. N. G. R., aged twenty-three, a vigorous primipara was delivered of a healthy child. Her pregnancy had been entirely normal and free from any unusual vaginal discharge or infection of the urinary tract.

Labor lasted eleven hours, no instruments were used, and there was no unusual hemorrhage. Chloroform was given for three quarters of an hour, and three vaginal examinations were made without gloves.

The delivery took place during an influenza epidemic and the baby and the grandmother suffered from the disease.

On the third day of her puerperium the patient had a sudden rise of temperature to 105, with headache, cough, and coryza. The fever varied from 100° to 104.5° F. for twelve days. A diagnosis of influenza was made.

For five days the patient had a low grade fever from 98°-100°. There was some discharge from a slowly-involuting uterus.

On the twentieth day of her puerperium the patient had a sudden rise of temperature to 102° and for 36 days she had a suddenly fluctuating temperature from 99 to 104.5°. There were a few slight chills and many profuse sweats at the periods of high temperature.

During a good part of each twenty-four hours the temperature was normal, and at this time the patient looked and felt well, and her appetite was good.

At no time during the first five weeks of the illness could any pathology be found in the uterus, adnexa, or pelvic veins. The uterus involuted well, and no pain or soreness was present in the pelvis or abdomen.

In the sixth week soreness, pain, and induration appeared in the lower abdomen at the outer end of the right broad ligament. A cord-like thickening from the uterus to the mass in the right lower abdomen could be palpated by the vagina. An extraperitoneal abscess was opened by an abdominal incision, and one ounce of thick pus, containing a pure culture of pneumococcus, evacuated.

The temperature then became normal for ten days only to be followed again by a temperature typical of thrombophlebitis, after which another abscess developed and opened spontaneously. After some fluctuation the temperature became permanently normal.

There were no metastatic foci at any time. The whole course of the disease was

a little more than one hundred days. The patient became quite anemic, but her condition never was extremely bad. At present she is perfectly well.

The diagnosis in the case is thrombophlebitis of the right ovarian vein with perivascular abscess.

CASE 2.—Mrs. E. W., aged thirty, the mother of one child, was delivered of a normal infant on March 10, 1920. Pregnancy had been normal, and she had had no abnormal vaginal discharge.

Labor was short, no instruments were used, and no internal examination was made. Chloroform was given for ten minutes. There was no hemorrhage and no lacerations.

Delivery took place in a hospital during an influenza epidemic. On the third day after delivery the patient had a sore throat, headache, and chill, and suffered an attack of influenza.

On the seventh day the patient had a sudden rise of temperature to 104°, pulse 112, and a severe chill. For twenty days thereafter the patient had rapid rises of temperature to from 102° to 105° with a pulse of from 90° to 120°. There were frequent chills and sweats. Between the rigors the patient looked well, and her appetite was good.

The total course of the temperature was twenty-seven days. Pelvic examination showed the uterus to be small, the lochia normal, and adnexa not palpable. There was, however, a small, sharply-defined, moderately-tender induration in the base of the left broad ligament. This very gradually disappeared as the patient recovered.

My diagnosis was thrombophlebitis of the left uterine vein.

CASE 3.—Mrs. E. G. G., aged twenty-seven, a primipara in rather poor health, was delivered of a sickly child, that died after three weeks.

Her pregnancy had been normal and free from any infection of the vagina or of the urinary tract.

Labor lasted twenty hours. Instruments were used and chloroform was given as an anesthetic. There was a deep bilateral laceration in the cervix and a moderate one in the perineum.

Delivery took place during an influenza epidemic and the patient suffered at least from a mild attack.

On the third day of her puerperium the patient developed a temperature of 103° with some slight tenderness in her left lower abdomen. This gradually subsided and she left the hospital on the sixteenth day with a slight temperature. During the third week her temperature ranged from 99° to 100°, but there were no local symptoms. At the beginning of her fourth week she suddenly developed a temperature of 103°, and a severe chill. The white blood count was 17,000. For eleven days she had sudden rises of temperature with slight chills. Between the rigors she was quite normal. The total duration of fever was 37 days. The uterus was large and subinvoluted, and there was some bloody discharge. The adnexa were normal.

In the outer part of the broad ligament was a well-defined, slightly tender mass, palpable both by the abdominal and by the vaginal examination. This mass gradually disappeared after the temperature became normal.

My diagnosis in the case was thrombophlebitis of the right ovarian vein.

DISCUSSION

DR. GORDON K. DICKINSON, JERSEY CITY, NEW JERSEY.—I desire to call attention again to the paper read before this society, a few years ago, by Dr. J. A. Harrar, in which he described a treatment of bacteriemia associated with thrombophlebitis, which consisted of an intravenous injection of a 2 per cent

solution of Epsom salts. In a number of cases of streptococcemia in women, I have used this procedure. There were chills and elevation of temperature of several weeks' duration, and a chronicity which gave no evidence of recuperation. The sulphate of magnesium solution would be followed by a severe chill, but the next day the temperature would come down to about normal and stay flat for a day or two, when there would be a repetition. More sulphate of magnesium solution would then be administered. Probably three such doses would be necessary before the condition became satisfactory. I have had one or two cases of staphylococcemia improved by this treatment, but that is not the subject for consideration. Before we resign our cases to surgery, not knowing where to find the vein, or resort to desultory treatment, we should give Dr. Harrar's suggestion a trial.

DR. E. GUSTAV ZINKE, CINCINNATI, OHIO.—This paper contains some surprises. I did not know it was possible for so many veins to be affected as the doctor described, and that they could be cured by operative procedure. The exsection of infected veins is not new; but it has been found impossible, if numerous veins are infected, to exsect them all; and, if we cannot do this, it is better not to attempt it at all. The majority of cases of thrombophlebitis recover without operation. The infection in thrombophlebitis is always of streptococcic origin. The life of the streptococcus septicus is limited, as demonstrated in cases of erysipelas. The germs enter the veins, destroy the endothelium, and cause hemorrhage. The resulting coagulation forms thrombi, after which the germs usually die. The thrombi are slowly absorbed, the circulation is reestablished, and the patient recovers. This is the most frequent termination of thrombophlebitis. It is only when the germs assume a pyogenic character that a suppurative septic phlebitis occurs, and it is then that the process of suppuration is carried into the circulation. The patient dies, usually, of an endocarditis or a general bacteriemia.

So far as operative procedure is concerned, I am surprised at the statements made in the paper, although I have no doubt the writer has good authority for them. But from what I know of thrombophlebitis from personal experience, I have good reasons to doubt the truth of the statement, not as made by the essayist, but by the authors he has quoted.

DR. SMEAD (closing the discussion).—My reason for writing this paper was not only because I had these cases to report, but because of an article which appeared recently in the *Journal of the American Medical Association* by an Australian advocating radical operation in these cases.

I thoroughly agree with the two last speakers that they are not operative cases. None of my cases were operated on except one that had an abscess which had to be drained.

I have gone over the literature carefully, and my paper is a report of the literature as to the advisability of operation. Personally, I believe conservative treatment is best. I should hesitate to go in and ligate these veins with the idea of preventing extension of the infection. However, there are many successful cases on record.

OVARIAN DERMOID CYSTS: ETIOLOGY, DIAGNOSIS AND TREATMENT

By Benjamin Rush McClellan, M.D., F.A.C.S., Xenia, O.

WHILE the term "dermoid cyst of the ovary" is not a scientific one, it has become so fixed in surgical and pathologic literature that it will require the dictum of a great leader in one or the other of these fields, to supplant it by a name more exact in its histopathologic description. Until in very recent years the origin of these strangely interesting neoplasms has remained in the domain of theory, and the controversies arising from their investigation and discussion were as interesting as ingenious. As recently as 1917, Graves expressed the opinion that "the dermoid does not develop from a true germ-cell or ovum, but from a blastomere which at an early time had been separated from the original germ-cell bundle," arguing that "the isolation of such a blastomere if transported away from its original location, accounts for the dermoid and teratoid tumors found in other parts of the body."

Probably the most illuminating contribution on the subject in recent years is that of Goodall of Montreal, who, in a very comprehensive report of his research in "Origin of Tumors of the Ovary" says: "Today there is but little doubt that the ovules by a system of parthenogenesis are responsible for the presence of dermoids and teratomata." Again, he tells us that "both these tumor types were really of only one kind, for they both contained products of the three fetal germinal layers, namely, the ectoblast, mesoblast and endoblast. The difference was one of the relative quantities of these and not of quality." Again, he quotes Lecaillon, who has done a great deal of work upon this subject, and who states: "We can consider as proved beyond all possibilities of doubt that parthenogenesis really takes place naturally in many mammals that are of widely differing species. Parthenogenesis is really evoked by this fact, and this fact alone, that the unfertilized ovum is endowed with the ability and property to evolve along the lines of embryonic development of segmentation and differentiation, and not because the egg has encountered special stimulus and special surroundings." He credits Loeb with the statement that parthenogenesis occurs in about 10 per cent of guinea pigs before they are six months old. Later the condition is much less frequent. Loeb describes one of these cases in the following words: "We see in each case a chorionic vesicle with trophoblast, plasmodia and syncytia penetrating into the neighboring tissue. There is also a structure present which is to be interpreted as a neural tube. As this type of growth occurs in the cortex of the ovary where follicles are normally seen, and are found within follicle-

like cavities, they can be derived only from ova developing parthenogenetically. Fertilization can be excluded as the life history of some of these animals is known and precludes such interpretation. It is very probable that parthenogenetic change sets in soon after ovulation, the altered condition in the ovaries at that time supplying the necessary stimulus." Loeb further says, "The later stages of these developing embryos bear some resemblance to chorioepitheliomata and teratoid tumors." Goodall remarks that Loeb might have gone one step further and included dermoids, for histogenetically they are the same. "Nägel, Minot, and Ribbert have found wandering ova throughout the genital abdominal cavity." "Grant such wandering of ova," says Pfannenstiel, "then the propagation of derivative tumors allows a very ready and easy explanation."

Having established the fact that all three germinal layers contribute to the growth of these tumors, it is not strange to find at times a great variety of histologic products. Cutaneous derivatives seem to predominate, especially hair and sebaceous material. Teeth, bone, cartilage, glandular tissue, mucous and serous membranes, muscle and nerve fibers, and cerebral substance are found. Violet, as early as 1907, reported one case of dermoid cyst containing thyroid tissue, and another containing lymphatic tissue.

Before considering diagnosis and treatment of these tumors a few clinical facts should be stated. First, as to the relative frequency of their occurrence. A report from the Mayo clinic states that in a thousand ovarian specimens 98, or nearly 10 per cent, were dermoids. Of these 14 per cent were double, and 7 per cent were malignant. They occur at any age, having been found in premature infants and in a woman of 84 years, but up to the time of puberty they are found more often than any other ovarian tumor. Cattermole reports an interesting case of dermoid cyst of the ovary in a child of eight years, as follows: "Ten days previous to the present sickness she had pain in the abdomen. Present attack began, after running down stairs, with sudden pain in right side and groin. On examination the abdominal muscles were so rigid that the underlying organs could not be made out. Temperature 99° F., no vomiting. An enema brought fecal matter, and was followed by vomiting of undigested food. The next morning the abdomen was relaxed and a round firm tumor mass could be felt in the median line above the pubes. She was operated upon the second day after the attack. Considerable dark fluid was found in the peritoneal cavity. The tumor was dark red in color, the size of a small orange, and attached by a narrow pedicle to the right ovary. The pedicle was twisted twice; the mass contained bone, hair, and several cysts containing bloody serum. Recovery."

Dermoids cause relatively few menstrual disturbances and, apparently, do not favor sterility. Gellhorn reported a case of bilateral dermoid

cysts, one of which he removed at the fourth month of pregnancy which continued to term. Later a second pregnancy went to a successful issue, after which the remaining tumor was removed. Wells also reported bilateral dermoids of the ovaries with removal of both, and the pregnancy uninterrupted.

These tumors are usually monolocular and of small size. Their growth is slow, which favors the development of a long pedicle which, in turn, predisposes to twisting, especially during pregnancy. This latter condition is prone to cause severe pain and pressure symptoms and may so interfere with the circulation as to produce inflammation and necrosis, which may lead to more serious complications, as general peritonitis, or fistulæ connecting with the urinary bladder and bowel. Quinby reports an interesting case: "A woman aged forty-three, complaining of dysuria, who gave no history of previous illness except that when she was 23 years old she had an attack of 'peritonitis.' About four months before entering the hospital she suddenly noticed that urination was painful, and this had persisted ever since. The urine was turbid, but never any hematuria, gradually dysuria, and frequent micturition increased, which was not relieved by emptying the bladder. Finally walking became painful. At the time of operation it was found that a dermoid cyst of the right ovary, containing hair and pultaceous material, filled the entire true pelvis and communicated with the vault of the bladder."

While as a rule these tumors do not attain a size much above that of a man's fist, they occasionally grow very large, as illustrated in a case reported by Michinard. His patient, (colored) aged thirty-one, had four children, labors normal, three miscarriages. Menstruation always normal except during the past 18 months, when flow became more profuse and of longer duration. She complained of frequent attacks of abdominal pain for about two years, no typical attacks of appendicitis pain. On examination the lower abdomen was felt to be filled with a movable doughy-like mass, somewhat inclined to the right. From the consistency of the tumor a dermoid cyst was diagnosticated. Operation revealed a 6½ pound dermoid, filled with sebaceous matter and kinky hair. Tumor was freely movable and easily extirpated. Left ovary normal. Recovery.

The length of pedicle often admits of extreme and unusual transposition as illustrated by Teller and Block. The cysts were typical dermoids, each about the size of a peach, the unusual features being that both cysts were on the right side. This was due to the fact that the left cyst had migrated behind the uterus, passed around the outer side of the pedicle of the right cyst and, after completely encircling it, had dropped between the right tube and its own pedicle into the culdesac. In so doing, it had strangulated itself and was practically free in the pelvis.

The foregoing clinical facts aid greatly in making a diagnosis. Fur-

thermore the predominent quality of the cyst contents may help, for example, if there is much hair, it is possible to get a characteristic crepitation, if there are many teeth and bony fragments these may be recognized by the examining fingers. Johnson says, "Dermoids with a large amount of putty-like contents may be indented by the examining fingers and these indentations may remain some time as in edema." Küstner says that these tumors, when unattached, have a tendency to float in front of the uterus. The case reported later by the writer confirms this statement. In view of the fact that so many of these neoplasms contain bone and teeth, the radiograph is of very great value. This is well brought out in a report of a case by Fagge. The patient, age 27, had at first diffuse abdominal pain, later it was of a colicky nature with nausea but no vomiting. Renal colic, due to calculus, was at first suspected; but x-ray showed two teeth at the level of the pelvic outlet; the root canals showing distinctly in the plate. X-rays of kidneys showed no evidence of calculi. After being sent to the surgical ward the patient suddenly began to vomit violently, became distended and tympanitic, showing signs of pressure on ureter and intestinal obstruction; previous to attack of obstruction she had suddenly passed an unusually large quantity of urine, suggesting that the renal symptoms at the early stage were due to temporary hydronephrosis. Laparotomy disclosed two ovarian cysts, firmly impacted in the pelvic brim. Both were multilocular, contained hair and the usual pulpy matter; teeth were found in the right cyst; the left cyst evidently pressed on the pelvic colon causing the obstructive symptoms. Both cysts were extirpated, no trace of ovarian substance or of supernumerary ovaries could be seen macroscopically. Recovery uneventful. Teeth in right cyst were about as long as adult canines; no other traces of dental or bony matter were found; a few calcified areas were observed in the debris. Notwithstanding the foregoing, the fact remains that a very small percentage of these tumors are diagnosticated before operation or autopsy.

In the matter of treatment there are a few established rules. Remove the tumor always by the abdominal route. Operate as soon as diagnosis is made; this is especially urgent when there is a co-existing pregnancy. When a dermoid is associated with uterine fibromata it should be removed with the uterus. Carefully scrutinize the opposite ovary. To illustrate the importance of this injunction I quote from a report of a case by Campbell: "A woman, aged forty, one child aged sixteen; no miscarriages; complained of colicky pains at nearly every menstrual period, otherwise her health was normal. On examination she was found to be tender about the appendix. She had a small cystic tumor, apparently of the left ovary, in Douglas' pouch. The right ovary was felt near the pelvic brim and seemed to be normal. Abdominal section was performed. The left ovary proved to be cystic, prolapsed and was removed. The right ovary was a little enlarged and had a fluctuation feel.

The greater part was excised. Both ovaries were found to be dermoid. The patient's symptoms were referred to the right ovary, which was not prolapsed, but contained a deep-seated cyst, bounded all around by ovarian tissue, which it was stretching as it gradually grew. This ovary was so normal in appearance that it was nearly left behind. Its tense cystic feel, and the fact that the pain was referred to the right side led to its getting more attention than it, at first sight, appeared to deserve, and terminated in its removal." On the other hand it is important to conserve as much ovarian tissue as possible in accord with the rule laid down by Schroeder in 1882.

In view of the fact that it is impossible to differentiate ovarian cysts that have been infected, it should be the rule that none of these cysts be tapped at time of the operation. Graves says: "The cyst content is proteolytic and corrosive, and when discharged into the abdomen by rupture of the cyst is conducive to peritonitis." The qualifying word "conducive" is well chosen because it is a well-known fact that the contents of these cysts have often escaped into the peritoneal cavity without any ill result. Graves also calls attention to the fact that, "Malignant change may take place in some part of the included tissue, most commonly of the epithelial type and next frequently of the thyroid tissue." Furthermore, these tumors are vulnerable to hematogenous infection; one notable case has been reported in which the typhoid bacillus was found. Therefore, never aspirate; and prevent, if possible, the escape of any of the contents of these tumors into the abdominal cavity.

CASE REPORT

Mrs. D., aged twenty-five, married four years, the mother of two children, two and one half years and nine months old, respectively. Family history good. In childhood she had all the communicable diseases incident thereto, plus typhoid fever. Following this her health had been remarkably good. Her menstrual life began at fourteen, was of the 28 day type, normal, and only interrupted by two pregnancies and subsequent lactation periods. She had no miscarriages.

This patient was referred to me by her family physician, March 21, 1920. She gave a history of cramp-like pain, five months previous, in the lower left quadrant of the abdomen, following a short horse-back ride. This pain was very severe and was accompanied by intestinal obstruction and a constant desire to urinate. However, she was soon relieved by an anodyne and a short stay in bed. Following this attack she discovered a round lump, easily felt, above the rim of the pelvis and a little to the right of the midline. She noted also that this tumor would disappear when she assumed the recumbent posture. Five days before coming under my observation she lost her balance in stepping from a chair to the floor and was again seized with violent pain accompanied by frequent micturition similar to, but more severe and persistent, than in the previous attack. Each physical examination of the patient was followed by pain, lasting for some hours. The examination revealed a tumor about the size of a large orange anterior to and a little to the right of the uterus. It could be displaced without moving the uterus, but this caused great pain. Apparently there was a marked increase in the size of the tumor during the few days she was under observation. This led to a preoperative diagnosis of a cystoma of the left

ovary with hemorrhage into the cyst. Celiotomy was performed March 24, 1920, through a median incision, and the tumor removed without difficulty. It was somewhat larger than a man's fist, very dark in color, and highly congested. The pedicle was tightly twisted. The tumor was monolocular and contained about 1000 c.c. of oily fluid, sebaceous material, a small tuft of light-brown hair, a fairly well formed lower jaw bone, ten well-formed teeth and a few irregular pieces of bone and cartilage. The symptoms were easily accounted for by the torsion of the pedicle and the mechanical interference with the function of the bladder and bowel. The patient made a prompt recovery and was discharged from the hospital April 11, 1920.

The writer, in reporting this case with its mistaken diagnosis, has been prompted by a desire to emphasize the fact that the mistake would have been avoided if we had called to our assistance a competent radi-

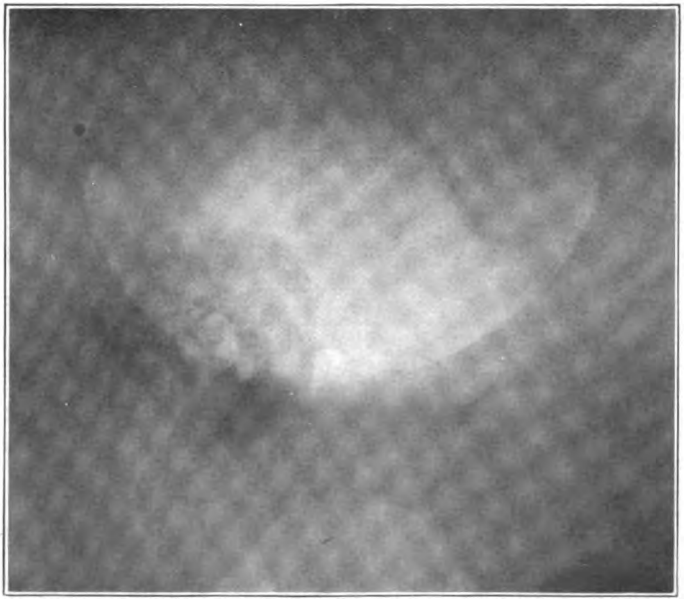

Fig. 1.—Roentgenogram showing outline of air filled bladder with overlapping shadow of ovarian dermoid cyst containing teeth and lower mandible.

ographer. The treatment and result would have been the same. But it is always a great gratification to a surgeon, and worthy of his best endeavor, to have his operative findings agree with his preoperative judgment.

In submitting herewith a radiographic print of the tumor (Fig. 1), above described, placed as near as possible to the position it had occupied, it is with the single purpose of calling attention to the advantage of an air filled bladder, in order to get a background in sharp contrast to the tumor outline. Finally, it is suggested that in addition to the foregoing, a stereoradiograph of all suspected dermoids would still better demonstrate their size, character of content, and relative position.

THE TREATMENT OF ABORTION COMPLICATED BY SEPSIS

By George A. Peck, M.D., F.A.C.S., New Rochelle, N. Y.

IF WE compare the various methods adopted for the treatment of abortion, complicated by sepsis, in different hospitals, or even those methods employed by the individual members of the staff of a single institution, we cannot fail to be impressed by the lack of uniformity of these procedures, and will doubtlessly conclude that as yet no standard treatment for this condition has been reached or agreed upon. Likewise, the literature bearing upon this subject shows a lack of uniformity of opinions that would indeed be confusing if one had not the convictions born of experience with this particular affection.

We must conclude, then, that this field is divided into two camps as it were;—the older, and until quite recently the stronger numerically, holding that every vestige of the products of pregnancy in the infected uterus must be promptly and thoroughly removed; while the other maintains that this infection is not dependent upon the mere presence of these products of pregnancy, and that the practice of their forceful removal is productive of serious and unwarranted harm to the patient.

If, then, the profession finds itself divided into these irreconcilable factions, in which of these groups will we as individual members find ourselves if we act according to the standards of our convictions and our practice of conscientious and scientific medicine and surgery?

For the purpose of clearness in this discussion, let us accept as a definition of the term "abortion," any pre-viable expulsion of the human ovum, and also when an abortion is accompanied by a rise in temperature to 101° F. (rectal) or 100° F. (mouth) which temperature cannot be attributed to any other condition, let us accept this as an abortion accompanied by sepsis. Let it be further understood that the end results and complications of abortion such as general sepsis, pyemia, parametritis, salpingitis, and peritonitis, are not inclusive or essential to this discussion.

Abortion, then, is but pregnancy interrupted, or cut short, and differs only in degree and not in kind from pregnancy at term; at the same time an abortion complicated by sepsis is comparable to puerperal sepsis and differs from it in degree only save for the fact that in the former the products of conception may still be in utero. With this corollary then, are we not justified in viewing these two conditions side by side or, if you will, in parallel lines?

Let us turn for the moment to puerperal infection and its treatment as it is generally accepted and standardized today. How does it com-

pare with the treatment in vogue twenty years ago? And how does the radical and aggressive treatment of abortion complicated by sepsis, as practiced by many today, compare with the treatment of puerperal sepsis of twenty years ago? The answer is obvious. Why, then, has not the treatment of abortion, complicated by sepsis, kept pace with the treatment of puerperal sepsis? The reasons for this may be attributed perhaps to social and criminal influences but, in the last analysis, is it not ourselves who are responsible?

DeLee[1] in his discussion of puerperal infection in his treatise on obstetrics (1913) says: "For the past five years, I have practically dispensed with local treatment in puerperal infection, being convinced that it does much more harm than good. Only if the woman has uterine hemorrhage do I interfere, and then by packing the uterus with a 2 per cent iodoform gauze to stop the flow and aid the expulsion of the retained mass causing it. This packing is repeated, if needed, daily for several days. After the foreign matter comes away when the gauze is removed, usually the temperature comes down, the patient's general condition improving. Only after local barriers are considered strong enough and involution of the uterus well advanced, is the removal of the retained material attempted. This is safe only after the temperature has remained normal for two or more weeks. One waits as long as possible. Nature often works wonders.

"It is gratifying to note that one voice after another is being raised against douches, curettage, and other local interferences with the process of healing adopted by nature, and the author hopes that the curet will soon be recognized as a criminal instrument in simple puerperal infection and that the other operations will be reduced to the one operation—to stop hemorrhage."

Let us now see how this principle of conservatism in the treatment of puerperal infection has been applied by some of our gynecologists to the treatment of abortion complicated by sepsis.

Ries[2] advocated it as early as 1909, and in a more recent article says: "While the active search for placental remnants in the uterus in all or the majority of cases of puerperal sepsis was the treatment in vogue years ago, the teaching largely accepted now is, 'hands off' the septic puerperal uterus except for serious hemorrhage! * * * Cases of abortion without fever may safely be left to spontaneous termination; the only contraindication being severe or protracted slight hemorrhage. Cases of septic abortion are no exception to this rule. * * * They can terminate spontaneously during the fever, and the fever drops after the abortion."

Here we have a treatment for abortion complicated by sepsis that in all its essentials parallels that which is advocated for puerperal sepsis. Polak[3] also says in this connection: "For years, as we have

already stated, we have considered that curettage of an incomplete abortion which is presumably infected, is an unsafe procedure, as by the use of the curet, we break through the protective leucocytic wall and spread the infection into the blood vessels and lymphatics of the uterus and into the parametrium."

Let us now turn to the consideration of the aggressive or radical treatment of this condition. Vineberg and Wiener,[4] as recently as 1917, in a joint communication say: "The treatment of febrile incomplete abortions on the second gynecologic service of Mt. Sinai Hospital, to which we are attached, has always consisted in emptying the uterus as early as possible. As we laid no stress upon the value of bacteriologic examination in these cases, it was only in especial instances that such an examination was made.

"When the period of gestation is less than eight or ten weeks, we employ branch dilators to dilate the cervix and, usually, use the placental forceps to remove the uterine contents, supplemented with the sharp curet to scrape away any tissue adherent to the uterine wall. We have no fear of the sharp instrument, our own conviction being that less traumatism is likely to be inflicted with the sharp curet, used with a light hand, than with a dull instrument that has to be vigorously applied. In cases more advanced than eight or ten weeks, we usually make use of a vaginal hysterotomy and then we have no difficulty in removing the uterine contents with the fingers, aided at times, with the placental forceps."

Darnall[5] advocates essentially the aggressive treatment as given above, but tempered with conservatism. He says: "The usual routine in our clinic, if pregnancy is more than three months advanced, and the infection not of a virulent type, is to do vaginal cesarean section, using the gloved finger to remove the products of conception. If three months or under, the cervix is rapidly dilated and the contents of the uterus gently removed with the small placental forceps."

Curettage, from being an operation which was performed for the slightest irregularity of function or other symptoms, has become one that is done only when clearly and definitely indicated; and it is no longer the custom of the surgeon who is doing an abdominal operation on the uterus or its appendages, to unlimber himself, as it were, by first doing a curettage. The reasons for this change are sound and sensible and are as applicable in the uterus that has undergone the changes accompanying pregnancy as they are in the nonpregnant one.

Ochsner[6] says in his introduction to a recent volume on general surgery: "The importance of eliminating trauma to the greatest possible extent seems to be more fully appreciated in connection with all extensive operations than at any time in the past," but it is to Bumm[7] that we must give richly deserved credit for his protest against any intrauterine operation in the presence of sepsis that does not take

into account the definite efforts made by Nature to combat infection. He says: "The employment of the curet to the infected puerperal uterus should be restricted to the utmost. It is erroneous to scrape the endometrium in the presence of septic streptococcus infection. About 80 per cent of all streptococcus infections in the puerperium recover spontaneously for the organism develops in the decidua a sort of granulation wall of closely packed leukocytes which prevents the further penetration of the germs, and induces the desquamation of the necrotic surface of the decidua, thereby automatically cleaning the endometrium. Scraping with the curet disturbs the natural curative endeavors of the tissues, the protecting wall of granulations is broken through and the passage is again opened to the bacteria. In the presence of very virulent forms of streptococci, rapid transmigration of the uterine walls and fatal infection of the peritoneum can be caused in this way. In the less virulent streptococcus infections, the principal dangers exist in the tissue-lesions produced by the curet at the placental site leading to venous infection."

Fisher[8] says in discussing the treatment of septic abortions and puerperal infections: "To compare an infected puerperal uterus and its resultant offensive discharge with a sewer and its contained filth as is so frequently done in practice; and to add to this erroneous simile the statement that not, unlike the latter, the former should be relieved of its necrotic structure by a resort to scraping with the curet and antiseptic flushings, may impress those members of the profession who, owing to their busy activities in other lines of work, remain unschooled in uterine pathology, or may meet with favor among those whose clinical observations lead them to assume that all symptomatic recoveries are proofs of cures following treatment, while regarding attendant failures and the graver complications that so frequently follow this form of surgical interference, as accidental coincidences that should be attributed to anything else rather than to the evil consequences of their good intentions.

"It is generally conceded that in cases of true blood infection, no form of intrauterine treatment can in any way influence or prevent the spread of the morbid process; while in those cases with a uterine reactionary zone, any form of localized interference endangering its destruction, exposes the patient to an auto-infection (vaccination of the healthy uterine wall) with coincident involvement of the circulation and a generalized reaction."

Here we have the practical application of the principles laid down by Bumm in the conduct and treatment of all septic uterine infections whether they be in abortions or in the puerperal state; but with all this evidence in mind, *pro* and *con*, the writer, from his practice and observations, adheres to the conservative and expectant form of treat-

ment of these cases of abortion complicated by sepsis, and for several years, has adopted the following general plan:

Diagnosis, by history taking and confirmed by vaginal examination after shaving and cleansing of the vulva, is routine practice and of primary importance; noting the condition of the cervix, adnexa, and amount and character of discharge; a vaginal and cervical smear are usually taken at this time as a matter of interest for determining the microorganisms present. *Posture.* The Fowler position is regularly employed for drainage of the uterus and for relaxation of the patient. *Diet* is restricted to water, orange juice, bouillon, and dry toast until temperature falls and capacity for digesting and assimilating food returns. The *bowels* are moved by an s.s. enema when desired. *Pain* is controlled by morphine sulphate gr. ⅛, hypodermically, repeated on order only. The *vulva,* after being cleansed and shaved, is protected by a sterile pad which is not put back when once removed, and which is changed every twelve hours and more often if soiled. *Douche.* A vaginal douche of potassium permanganate, 1-5000, at a temperature of 110° F. is ordered for offensive discharge, or for other reasons when indicated, otherwise no douche is given.

Following the adoption of this expectant or conservative treatment, even though sepsis be present, the abortion may terminate spontaneously as in a case without this complication. The temperature curve steadily and gradually falls, and there is a general improvement in the condition of the patient. Each and every day of such treatment aids in the formation and development of the reactionary zone, and in an apparent diminution in the force and virulence of the infection. *Hemorrhage* when it occurs in any considerable amount cannot be disregarded, but the method employed for its control, is determined by (*a*) the condition of the cervix, as to whether dilatation has become sufficient for emptying the uterus or not; and (*b*) the length of time the patient has been under treatment and the effect of this treatment upon the temperature curve.

Vaginal packing of iodoform gauze (2 per cent) is employed when dilatation of the cervix has not taken place, also in cases where much blood has been lost, packing of the cervix and vagina with iodoform gauze may be employed, especially when the patient has recently come under treatment and the employment of instrumental removal of products of conception is thought to be too great a hazard. After dilatation is complete, and the products of conception have not been spontaneously expelled, the finger may be gently introduced within the uterine cavity and its contents thus removed. Failing in this, at least a separation of the foreign body can usually be effected, and its removal accomplished with placental forceps. In hemorrhage, at the third month, or beyond, with incomplete cervical dilatation, the employment of a dilating bag that will plug the cervix is considered

preferable to rapid and forcible dilatation, or to vaginal hysterotomy. The severity of the hemorrhage and the condition of the patient will determine the course.

In the beginning of the expectant treatment, while the temperature is still high, intrauterine manipulations are avoided, if possible. Later on, however, when the temperature is less, or has disappeared, mechanical intrauterine interference for hemorrhage may be undertaken with comparative safety. When the patient is received late in the febrile state, and *after* a curettement has been performed, the expectant treatment alone is applicable, but here one is most likely to meet with the deeper, or general, infections with their usual complications and sequelæ.

Conservatism in the treatment and consideration for Nature's efforts in these cases of abortion with sepsis, will not only give the best results finally, but one avoids being accused of being responsible for the unhappy results that must follow criminal interference with pregnancy,—a condition with which septic abortions are inseparably associated. The advantages of the conservative treatment to the practitioner who cannot avail himself of the benefits of hospital care in the management of these cases, are also worthy of consideration.

CONCLUSIONS

1. The conservative treatment of abortion complicated by sepsis is based on pathologic entities and clinical end results.

2. Hemorrhage is the only symptom that may demand a prompt and thorough emptying of the uterus for its control.

3. Every intrauterine manipulation or procedure should be executed with the greatest care to avoid traumatizing and otherwise injuring the endometrium.

4. Late cases, and especially those already subjected to curettement, are eminently suitable for this form of treatment.

REFERENCES

[1]DeLee, J. B.: Principles and Practice of Obstetrics, W. B. Saunders & Co., 1913, p. 877.
[2]Ries, Emil: Surg. Gynec. and Obst., April, 1918, p. 400.
[3]Polak, J. O.: Am. Jour. Obst., 1917, p. 409.
[4]Vineberg, H. N., and Wiener, Sol.: Am. Jour. Obst., 1917, p. 975.
[5]Darnall, Edgar: Interstate Med. Jour., 1917, p. 1066.
[6]Ochsner, A. J.: Vol. on Gen. Surg., Introduction, Prac. Med. Series, 1920.
[7]Bumm, E.: Sammlung zwangloser Abhandlungen aus dem Gebiet der Frauenheilkunde und Geburtshilfe, 1901-2, iv, p. 5.
[8]Fisher, J. M.: Jour. Med. Soc. New Jersey, 1917, p. 265.

DISCUSSION

DR. JAMES N. WEST, NEW YORK CITY.—The paper read refers to abortion with sepsis. It is very difficult to know when sepsis has actually begun. I have investigated this subject in my own clinic at the Post-Graduate Hospital and have tried to draw some conclusions. About twelve years ago I made an

examination into the cause of diseases of women entering my clinic, and found that 23 per cent of the cases entering the outdoor department were due to the effects of incomplete abortion. These diseases ranged all the way from thickening of the uterosacral ligaments, retroversion, cellulitis, and other results of inflammatory action in the uterus. The most severe cases did not appear at the clinic, but they came to the hospitals, brought in ambulances, with general peritonitis, septicemia, pelvic abscess or pyosalpinx. This is a very serious indictment of abortion, for the results appear in women at the most important part of their lives, when their usefulness is greatest to their families. It therefore becomes a matter of supreme importance how an abortion should be treated. Finding that 23 per cent of cases seemed to trace the morbidity to abortion, I began to wonder if there was any way I could reduce this terrible morbidity. So I adopted the plan of not waiting for sepsis or anything else, but taking every patient who had come to the stage of inevitable abortion, and curetting them at once, after preparing them as I would for a vaginal hysterectomy, by painting the interior of the cervix with iodin and carbolic, before beginning dilatation. Finally, after cleansing the uterus, I swab the interior with equal parts of iodin and carbolic. I have not had any of this trouble with abortion cases since, and there is no morbidity. The treatment ends it.

DR. WILLIAM M. BROWN, ROCHESTER, NEW YORK.—I think Dr. West has gone a little outside of Dr. Peck's paper, which dealt with the infected abortions, or the time when sepsis or infection had arisen. I do not think any one can question the procedure adopted by Dr. West, except the matter of the curet. My own custom is not to curette, as I doubt my ability to scrape and denude entirely the endometrium. In cases of incomplete abortion, infected or potentially infected cases, it is proper to disinfect thoroughly. I take a piece of gauze and scrape the endometrium, then I iodinize it thoroughly, and let it alone. There is never any trouble in a case like that after that is done, but in case of infection, I feel that I take the life of the patient in my hands if I invade the cavity with sharp instruments. In such cases, in the absence of hemorrhage or pieces of placenta in the cervix, I let the patient alone and place her in the semi-Fowler position. The ideal bed is one with a Gatch frame spring and a double hinge.

A PRELIMINARY REPORT ON PYELITIS IN PREGNANCY WITH REPORT OF CASES

By Greer Baughman, M.D., F.A.C.S., Richmond, Va.

THE three cases of pyelitis in pregnancy to be reported, were selected because they were studied over a considerable period of time; they present certain features in common that are rather characteristic of the condition and, at the same time, are sufficiently varied to make them interesting. All of them were treated with pelvic lavage; pyelograms being taken from time to time as the pelvic size changed, provided the condition of the patient warranted this added discomfort. All were private patients treated at a private hospital.

So insidious is pyelitis in its onset, frequently giving rise to no local symptoms and causing no temperature, that one is often puzzled to find the cause of the malaise, headache, and nausea of which these women complain. The proper diagnosis is, however, very important; because an untreated pyelitis can be the predisposing cause of an abortion or a premature labor. That is serious enough; but when we remember that even after delivery the pyelitis usually persists, infecting the kidney, reducing its function, or crippling it entirely, then pyelitis of pregnancy must be classed with the more serious complications of gestation.

Since Kaltenbach, 1871, showed the connection between pyelitis and pregnancy, more or less interest has been taken in the subject. The question of the method of infection, whether it be by way of the lymphatics, the blood stream, or ascending from the bladder, has produced a great deal of discussion.

Neisser, Opitz and Folin showed that the healthy intestine would not allow the bacillus coli to pass through its wall. Folin demonstrated that to produce a pyelitis it was necessary to tie off both rectum and ureter, but that the simple occlusion of the urethra was sufficient to produce a cystitis.

Whatever our judgment as to the method of bacterial invasion, all are agreed that obstruction to the ureter is the predisposing cause, as was experimentally shown by Mirabau, 1907, when he found a pyelitis on the side that was tied when bacilli coli were injected into the ear of a guinea pig. It is interesting to note that Carl Franke, 1915, found a direct lymphatic connection between the rectum and the right kidney.

While not denying the fact that the enlarging uterus itself, twisted to the right as it usually is, may be a decided factor in pressing upon

the ureter and causing dilatation with stagnation, certainly in the later months of pregnancy the presence of the presenting part in the pelvis, particularly if the patient be constipated, is the main predisposing cause of pyelitis by making direct pressure upon the ureter as it passes over the brim of the pelvis.

In the treatment of pyelitis drainage seems to be the one important thing. The method of drainage has to be determined with each case. In some the giving of large amounts of hexamethylamine water is sufficient to overcome the obstruction, particularly if a posture is found that will remove the obstruction. Many cases will respond to pelvic lavage with drainage by means of a pelvic catheter. In some cases we are faced with the necessity of a nephrostomy, inducing abortion or premature labor. Of course rest in bed in such a manner that the best drainage may be obtained, proper diet, and attention to the bowels must not be overlooked.

CASE 1.—Mrs. J. M. C., 546. White; aged twenty-five; iii para; 5 feet 7 inches tall; weight, 109 lbs. *Personal History*: Measles and typhoid during childhood. Menstruates every twenty-six days; duration, five to six days; no pain or

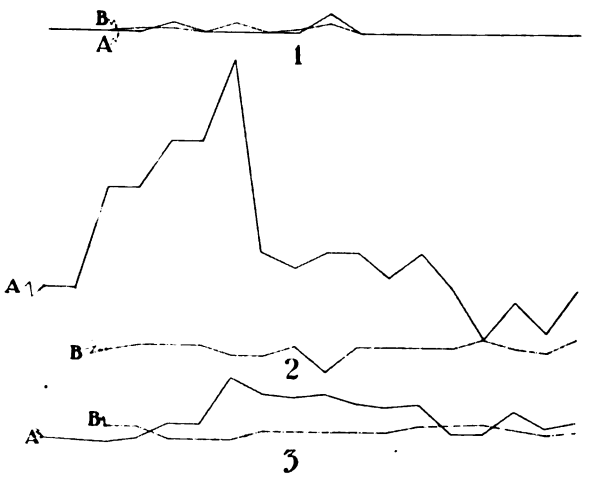

Fig. 1.—Mrs. J. M. C.—1-A. Represents the curve of bacteria found in the bladder upon the days of treatment. (B. coli.)
1-B. Represents the quantity of pus found in the bladder upon the days of treatment.
2-A. Represents size of kidney pelvis of the right side upon the days of treatment, the normal size of 10 c.c. being taken as standard.
2-B. Represents the kidney function of the right side upon the days of treatment, the normal function being taken as 15.
3-A. Represents size of kidney pelvis of the left side upon the days of treatment, the normal size of 10 c.c. being taken as standard.
3-B. Represents the kidney function of the left side upon the days of treatment, the normal function being taken as 15.
Labor was induced after the fifth treatment.

excessive flow. One abortion at third month in fall of 1916; cause not known. Wassermann, negative. First labor induced by Voorhees bag as pregnancy was prolonged. Labor uneventful; duration thirteen hours. Vulval tear; immediate catgut repair. Puerperium normal. Pelvic measurements normal. During the second full-term pregnancy she had a slight bleeding, July 16. Quickening, De-

cember 9. Nausea slight, but persistent for the first five months. Urine normal until February 23, 1920, when nausea became very bad. Vomiting very persistent. Pain over abdomen and back, with the greatest tenderness over right kidney. No elevation in temperature. Catheterized urine was acid and contained a few pus cells.

Diagnosis: Acute pyelitis, right side. She was referred to Dr. Joseph F. Geisinger for cystoscopic examination and treatment. (The chart (Fig. 1) gives a graphic account of the results of the cystoscopic findings.) In spite of the fact that the condition of the kidney pelves showed no improvement, her clinical condition improved. The almost complete anorexia, present at first, was followed by an increased desire for food. At the fifth irrigation it was decided that the patient was in sufficiently good condition to justify the taking of a bromide pyelogram. The report, made by Dr. F. M. Hodges, showed that there was great

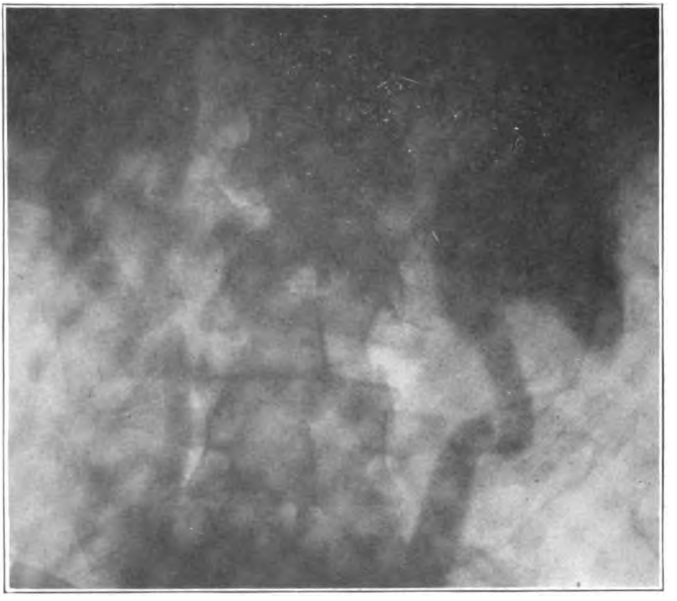

Fig. 2.—Mrs. J. M. C. 8-546. Bromide pyelogram. Mar. 18, 1920. Great distention of right pelvis and ureter; moderate distention of left pelvis and ureter. Both ureters kinked and tortuous.

distention of the right kidney, pelvis and ureter, and moderate distention of left pelvis and ureter. Both ureters were kinked and tortuous.

At the sixth irrigation it was noted that the patient had suffered a great deal after the last irrigation; she was not eating so well, and had considerable nausea. As the calculated date of delivery was April 4 and the child viable, it was decided to induce premature labor. March 27 was the day selected for this purpose, as it had been found that the patient usually did better for four days after the irrigations. At 6:30 P.M. a bougie was introduced. Twenty-four hours later, labor not having started, the bougie was removed and a Voorhees bag introduced after manual dilatation of the cervix. Labor began shortly thereafter. The bag was passed at 6:30 A.M., March 29, and at 8.30 A.M. a girl was born; weight, 6 lbs., 4 oz., and 49 cm. long. The child is alive, breast-fed, and unusually healthy. No temperature during the puerperium.

Five irrigations were given after delivery; the first, fourteen days after de-

livery. The clinical condition of the patient was markedly improved. On April 22, a cystitis developed, which was treated by daily bladder irrigations followed by mercurichrome instillations. July 8, a catheterized specimen proved negative for pus or casts. Vaginal examination shows uterus and appendages normal. She has gained nine pounds in weight, and is feeling fine.

CASE 2.—Mrs. R. C. H.—8-132. White, aged twenty-six; primipara; 5 feet 3½ inches tall; weight, 107 lbs.; family history negative. *Personal History*: All infantile diseases. Diphtheria at ten. Develops urticaria when she takes quinine. Menstruates every 28 days; duration 4 to 5 days; no pain. Last menstruation June 1 to 5, 1919; quickening November 11, 1919; probable date of delivery March 7, 1920. Had a slight painful bleeding from the uterus November 15, 1919. Fetal movements continue vigorous. November 14, severe pain in back and right side; since that time has had temperature reaching as high as 104° F. Urination frequent, accompanied by burning sensation. Had a chill the morning of November 19, the day I first saw her, and two other chills the same day. Evening temperature 101°; leucocytes 16,000; polynuclear 90 per cent. Urine acid; trace of albumin; sp. gr. 1.018; a few pus cells and kidney epithelium. During the acute attack she suffered with nausea. *Diagnosis*: acute pyelitis, right side. The case

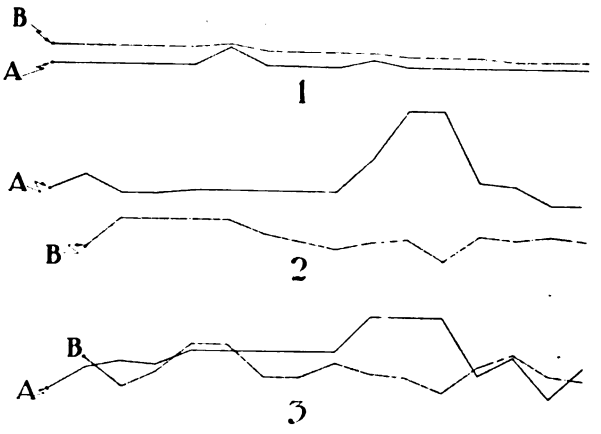

Fig. 3.—Mrs. R. C. H.—1-A. Represents the curve of bacteria found in the bladder upon the days of treatment. B. coli were found except upon the thirteenth, fourteenth and sixteenth treatments, when staphylococcus albus was found.

1-B. Represents the quantity of pus found in the bladder upon the days of treatment.

2-A. Represents the size of the right kidney pelvis upon the days of treatment, 10 c.c. being taken as the normal.

2-B. Represents the kidney function of the right side upon the days of treatment, the normal function being taken as 15.

3-A. Represents the size of the left kidney pelvis upon the days of treatment, 10 c.c. being taken as the normal.

3-B. Represents the kidney function of the left side upon the days of treatment, the normal function being taken as 15.

She entered into labor after the twelfth treatment.

was turned over to Dr. Joseph F. Geisinger for cystoscopic examination and treatment.

After the first three bladder irrigations the patient was improved decidedly, having but slight reaction, but the fourth treatment was followed by much nausea for two days. The fifth treatment was done with mercurichrome, succeeded by very little reaction. It was possible to make bromide pyelograms at the sixth treatment.

December 15, Dr. F. M. Hodges reported upon the bromide pyelogram that

the left pelvis and ureter were moderately distended; the right pelvis and ureter, though not completely filled, were more dilated than the left. Kink in ureters below pelvis, but dilated below that point. Vertebral column of fetus to the right; its position probably interfering seriously with the emptying of the kidney pelvis on that side.

At the next irrigation the general appearance of the patient was improved. She had very little reaction from the pyelogram. At the ninth irrigation it was noted that the right kidney pelvis failed to empty itself until aided by manipulation over the kidney region. At the next irrigation it was determined, the child being viable, that labor should be induced January 31. A bromide pyelogram was made and reported upon by Dr. F. M. Hodges, January 13. Fetus well shown. Moderate dilatation of both kidney pelves, marked on the right where there is distinct clubbing

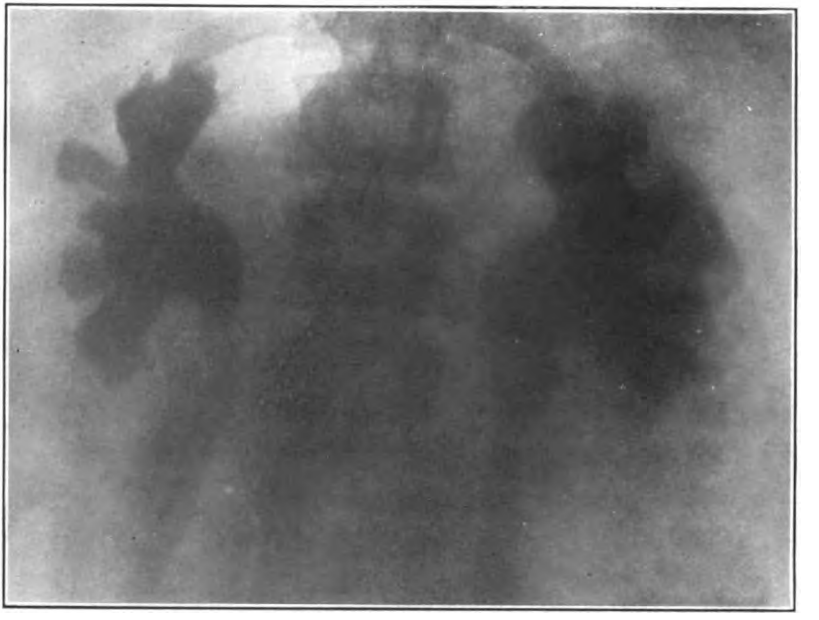

Fig. 4.—Mrs. R. C. H. 8-132. Jan. 13, 1920. Bromide pyelogram. Fetus well shown. Moderate dilatation of both kidney pelves, marked on the right where there is clubbing of the calyces. Distorted ureters in the upper part; not so much dilatation below.

of the calyces. Distorted ureters in the upper part; not so much dilatation below. Clinical condition good. Very little reaction followed the last irrigation. At the twelfth irrigation, January 19, it was noted that the patient suffered considerably during the examination. She was irrigated with 2 per cent silver nitrate solution, and, contrary to advice, went home immediately after the irrigation. She had a restless night. Labor began at 7 A.M., January 20. She was hurried to the hospital. Examination revealed complete dilatation of the os at 9 A.M. and delivery occurred at 1:40 P.M. the same day. The baby was born asphyxiated and could be resuscitated with difficulty only. The child died at 6:15 P.M. The mother sustained a fourchette tear which was immediately repaired. There was no temperature during the puerperium.

January 31, eleven days after delivery, the lavages were started again. Very slow flow of urine, especially from the right side, was noted. It was necessary to use pressure upon the kidney to cause complete evacuation of the pelvis. Clinical

condition very good. At the next irrigation there was a fairly free flow of urine; but the right pelvis was evacuated only after pressure upon the pelvis from behind. There was no effect upon the flow of urine with the patient in the sitting posture.

February 23, a bromide pyelogram was made by Dr. F. M. Hodges. Ureters now practically normal in size, and there was no kinking of them. Left pelvis well filled and normal in size. Right pelvis only partially filled; solution has accumulated in the calyces. He thinks that the general kidney shadow on the right side is smaller than normal. He also believes that the right kidney may be smaller than normal, accounting for the continued reduction of function on that side. Clinical condition of patient very good. At the irrigation on March 11, it was noted that the patient complained of some pain in passing No. 10 catheter. There was a free flow of urine from both sides. Clinical condition excellent.

Fig. 5.—Mrs. R. C. H. 8-132. Feb. 23, 1920. Bromide pyelogram. Ureters now practically normal in size, no kinking of the ureters. Left pelvis well filled, normal in size. Right pelvis only partially filled, solution has accumulated in the calyces. The general kidney shadow on the right side is smaller than normal. The kidney may be smaller than normal accounting for the reduction in function on that side.

CASE 3.—Mrs. J. T. D.—7-2172; white; aged 24; ii para; 5 ft., 3 in. tall; weight, 125 lbs.; family history negative. *Personal History*: Had all of the infantile diseases. One child, three years old. Normal delivery. No complications. Menstruates every 28 days; duration, 7 days; no pain. Last menstruation March 1 to 8. Quickening June 27. Probable date of delivery, December 6, 1919. Patient was first seen in consultation with Dr. Joseph Bear, October 16, 1919. She was then suffering from severe nausea and vomiting for a period of ten days. She complained of pain in her abdomen and back. There was great tenderness over both kidneys, particularly the right. Catheterized specimen of urine was acid in reaction, showed some pus and a few red blood cells. Temperature, 101. Temperature had been continuous for three days. There was considerable mucus in the stools. *Diagnosis*: Pyelitis, right side, with possible involvement of the left kidney. She was moved to the hospital and turned over to Dr. J. F. Geisinger for treatment.

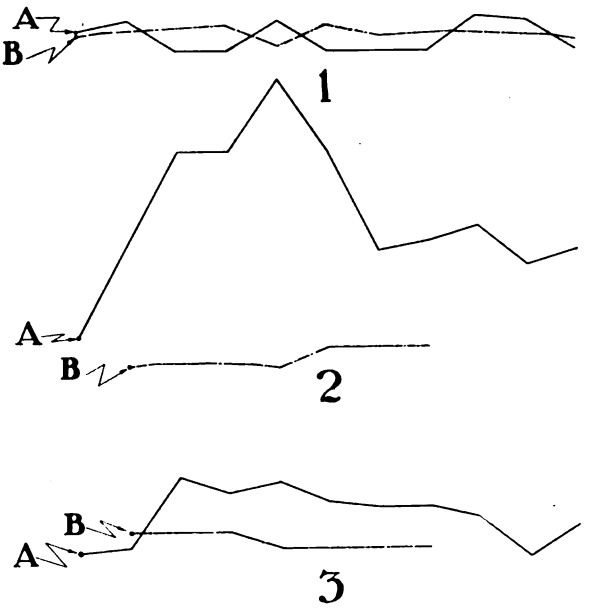

Fig. 6.—Mrs. J. T. D.—1-A. Represents the curve of bacteria found in the bladder upon the days of treatment (Staphylococcus albus).

1-B. Represents the quantity of pus found in the bladder upon the days of treatment.

2-A. Represents the size of the right kidney pelvis upon the days of treatment, 10 c.c. being taken as normal.

2-B. Represents the kidney function of the right side upon the days of treatment, the normal function being taken as 15.

3-A. Represents the size of the left kidney pelvis upon the days of treatment, 10 c.c. being taken as normal.

3-B. Represents the kidney function of the left side upon the days of treatment, the normal function being taken as 15.

Labor was induced after the seventh treatment.

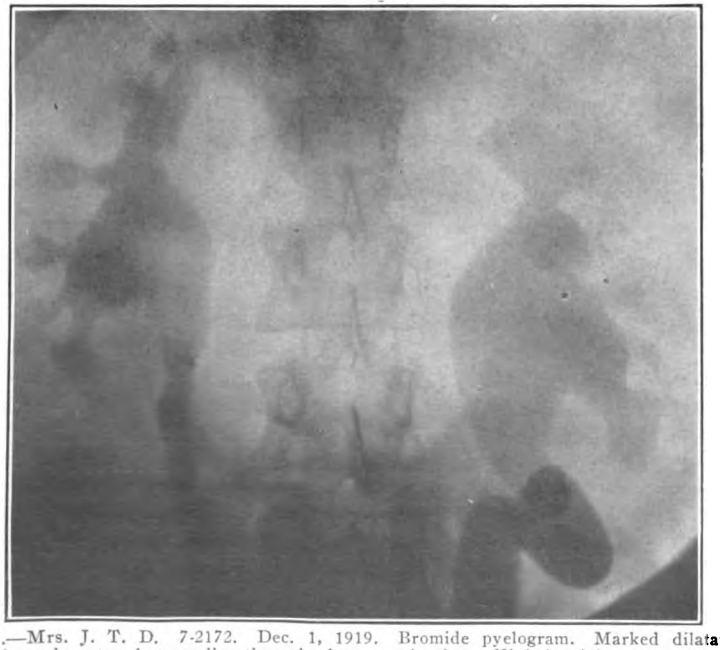

Fig. 7.—Mrs. J. T. D. 7-2172. Dec. 1, 1919. Bromide pyelogram. Marked dilatation of right pelvis and ureter, but smaller than the last examination. Kink in right ureter near pelvis. Left ureter also distended, as well as the pelvis, but the calyces are normal.

Examination at the hospital showed hemoglobin 60 per cent; leucocytes 8000; polynuclears 72 per cent; large mononuclears 10 per cent; lymphocytes 18 per cent. The result of the cystoscopic examination added to the diagnosis of pyelitis hydro-

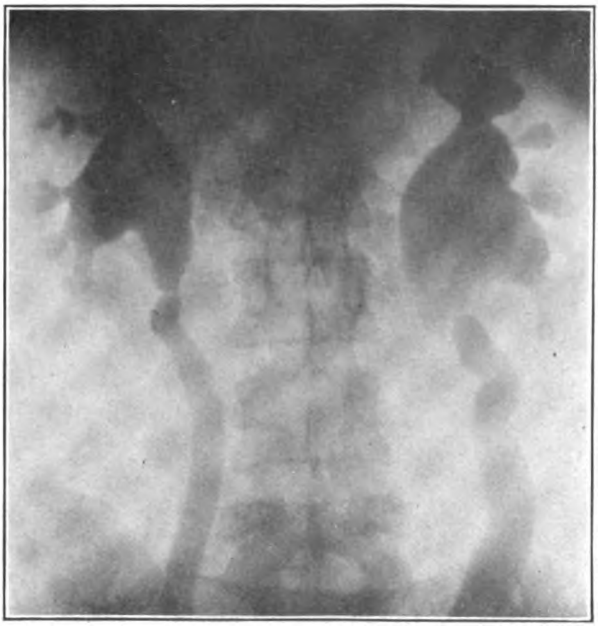

Fig. 8.—Mrs. J. T. D., 7-2172. Dec. 9, 1919. Bromide pyelogram. Left side about the same, but the right side shows definite signs of improvement.

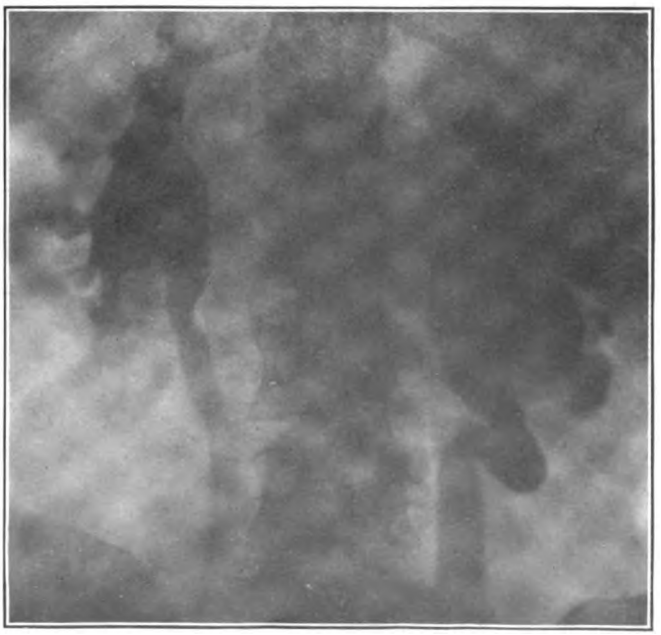

Fig. 9.—Mrs. J. T. D., 7-2172. Dec. 18, 1919. Bromide pyelogram. Left ureter and pelvis moderately distended, right pelvis and ureter though not completely filled, more dilated than the left. Kink in ureters below pelvis, but ureters dilated below that point.

nephrosis. Following the first irrigation the patient's nausea and vomiting improved very much. The improvement continued after the second irrigation. The result was similar after the third; but she began to have sweats. At the fourth irrigation,

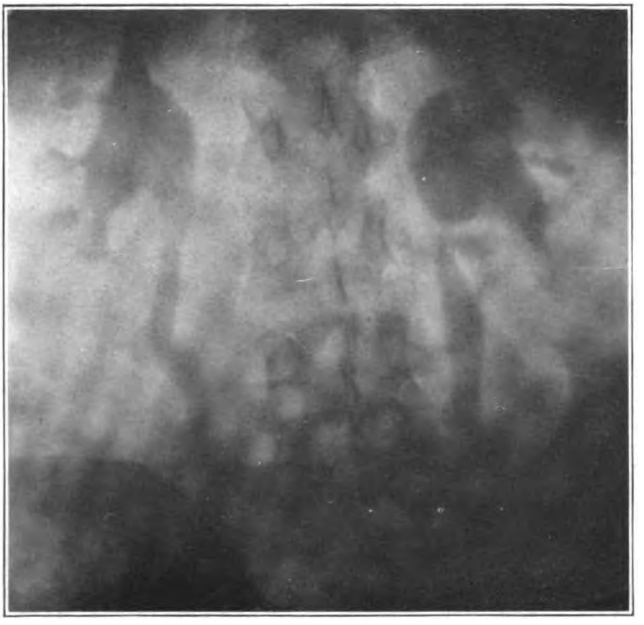

Fig. 10.—Mrs. J. T. D. 7-2172. Feb. 2, 1920. Bromide pyelogram. Pelves and ureters almost normal.

Fig. 11.—Mrs. J. T. D. 7-2172. April 26, 1920. Bromide pyelogram. Pelvis and ureters practically normal.

a bromide pyelogram was taken, but the plates did not show the pelves. At the fifth irrigation a successful bromide pyelogram was made by Dr. F. M. Hodges, which showed enormous dilatation of the right pelvis and ureter. The left pelvis proved normal. General condition of patient excellent; she eats well, but has an occasional vomiting spell. Following the taking of the pyelogram she had a recurrence of nausea, vomiting and headache, though not so severe as when she was brought to the hospital. The catheter was left in the right pelvis for two hours after the irrigation of November 17. It was noted that the nausea, vomiting, and headache were much better since the last irrigation. As the child was now viable, and as the left pelvis had begun to dilate, it was decided to induce labor.

At 9:30 P.M. a Voorhees bag was introduced. Since labor had not started, a bougie was also inserted. Labor began at 11:30 P.M. The bougie was passed, and at 12:07 A.M., November 19, a boy was born; weight, 7 lbs., 12 oz.; length, 48 cm. The baby thrived and is well. No temperature during the puerperium.

Fourteen days after delivery she was irrigated and a bromide pyelogram was made by Dr. F. M. Hodges. He reported a marked dilatation of the right pelvis and ureter, but smaller than at the last examination. Kink in right ureter near the pelvis. Left ureter and pelvis also distended, but the calyces are normal. She was allowed to go home on December 2. There was some reaction from the last irrigation. On December 9, a bromide pyelogram was made. It showed the left side about the same as before, but the right side showed definite signs of improvment. Clinical condition good. On December 18, another bromide pyelogram was made. Right pelvis well filled, slightly smaller than at the last examination. The calyces are practically normal. Ureter and pelvis still dilated. Patient had a recurrence of sweating. Pelvic examination showed everything normal and nothing to account for the sweating. She is gaining weight. December 31, a bromide pyelogram was made again, but the plate was poor. However, both pelves were well filled, and both showed marked improvement. Clinical condition excellent. February 2, a bromide plate was made which showed the pelves almost normal in size. April 26, the condition of the patient is excellent. She said that she felt the catheters every inch of the way.

SUMMARY

1. In all of the cases the right pelvis was principally involved.

2. In the first two cases the bladder was early and persistently involved. In the last case the bladder was occasionally inflamed.

3. In the first two cases the colon bacillus was the exciting cause. In the last case the staphylococcus albus.

4. In all of the cases the curve representing the sizes of the right and left pelves is almost parallel.

5. The symptoms in all cases improved under irrigation.

6. The most marked improvement was noted following delivery in all of the cases, showing that the obstruction was due to the uterus and its contents.

7. The fact that the right kidney of the second case is congenitally small will account for the continued reduction of function upon that side.

8. There was noted a compensatory increase in function upon the side that was less involved.

9. It was possible to irrigate these cases within two weeks after delivery.

10. None of the cases had any temperature during the puerperium.

11. Even in enormous dilatations, as in Case 3 where the pelvis held 100 c.c., a cure is possible.

12. Living babies were born in the cases upon which labor was induced at the selected time; while the case that entered labor before the time set for the induction of labor, gave birth to a dead child.

REFERENCES

Davis, A. B.: Bulletin Lying-in Hospital, New York, March, 1920.
Englehorn: Bayerische Gesellsch. f. Geb. u Gyn., January, 1914.
Goyet: XXVI Congres de l'Association Francoise de Chirugie, October, 1913.
Gustaffson: Monatschr. f. Geburtsh. u. Gynäk., 1916.
Posner: Berl. klin. Wchnschr., 1915, No. 3.

DISCUSSION

DR. JOHN OSBORN POLAK, BROOKLYN, NEW YORK.—The subject Dr. Baughman has brought before us is of great importance because of the frequency of error in diagnosis made between pyelitis and appendicitis. That is one of the most frequent mistakes in cases of acute right-sided pain complicating pregnancy. Those of us who are doing obstetrics know the frequency of pyelitis is so great that it is the first thing we suspect rather than appendicitis, and in the history there is always a subjective picture of bladder disturbance preceding pain and temperature and the other characteristic symptoms.

The treatment the doctor suggested is of considerable interest. For a number of years we had our urologists take care of our kidney cases, but for the last five years we have done our own urological work, and we have had better results in the treatment of our pyelitis cases. There is stasis, and as a result of it a lowered resistance, the migration of bacteria, and infection of the kidney. The infection is not often from the bladder, but is directly, as a rule, from the colon. Usually the bacteria that are found are the colon bacilli. Occasionally we get a mixed infection. A mixed infection with staphylococcus is much more resistant to treatment. The colon cases are readily curable and the only question is whether irrigation or drainage is the most suitable procedure. Our best results have been obtained by the introduction of the ureteral catheter, leaving it in for twelve hours at a time. The objection we have to irrigation is that we have not been able to get our pyelograms any more than the doctor has, showing diminished pelvis, except after continuous drainage, and where we were using irrigation we were getting the pictures the doctor has shown on the screen, namely, dilated pelvis. A pyelogram is important. If you take a pyelogram in several postures it shows whether there is a kink in the ureter, and the picture indicates the direction of natural drainage. Some of these cases need the Trendelenburg position; others need the Fowler position.

One point I would like to ask the essayist about is whether he has been able in all these cases to follow them up and find whether there has been absence of bacteria. The bacteria in some of our cases have persisted after a clinical cure; that is, we have continuously found bacteria in the urine, particularly so in cases of mixed infection. The patient runs no temperature; the kidney function is all right; but every once in a while the patient has a little disturbance of urination. We do not find pus, but we do find, on culture, bacteria in the urine.

DR. HENRY D. FURNISS, NEW YORK CITY.—The title "pyelitis of pregnancy" is a misnomer, for the disease exists just as often in the absence of pregnancy. As the obstetrician sees pyelitis only as a complication of pregnancy he is apt to think of the condition only as pyelitis of pregnancy. Most of the cases of pyelitis seen by the gynecologist are independent of pregnancy.

At the Sloane Maternity Hospital in doing phthalein estimations on pregnant women, it was found in catheterizing them after voiding there was often residual urine in the bladder, which is more important than pressure on the ureter itself as a cause of urinary tract infection.

Dr. Polak and Dr. Baughman spoke of kinking of the ureters. I think that an inflammatory process is secondary and is a result of the condition and not the cause of it. You see it in all these pyelograms that have been shown here. The pelvic dilatation is, according to Braasch's classification, of the inflammatory type and not the distinctly mechanical.

The interruption of pregnancy I believe is not a good procedure because it does not cure the patient, as a rule. It may help, but it does not cure.

Early local treatment of these cases, whether in the pregnant or the postoperative, or any other type should be done. If it is performed carefully there is practically no more discomfort than from catheterization of the bladder, especially if one uses a small single barrel catheteroscope. It is unnecessary to use a large catheter to force the obstruction. I think when you get rid of the obstruction, nitrate of silver is the best thing to use. Irrigate first with boric acid to clear away all urine, so that the silver will not be precipitated by the chlorides. I believe that nitrate of silver does not act as an antiseptic but as an astringent, producing shrinking of the mucous membrane and establishing better drainage. If you examine the bladder you will observe that portion around the ureter intensely congested. There is the same process in the ureter, the swollen mucosa narrows the lumen and interferes with drainage. The astringent action of the silver causes this to shrink and improve drainage. I saw a patient who developed cystitis and kidney infection after a severe labor. Unfortunately that patient was operated on and one kidney removed. The cystoscopic picture showed an intense bullous edema located over the trigonum. Section of the kidney and ureter showed an extension of the trigonal condition of the ureter into the pelvis for one-quarter of an inch up, where it was distinctly limited. In that case the retention and faulty drainage were due to the swelling of the ureteral mucosa. I do not believe in these cases we can judge too much by the size or retention of the pelvis of the progress of the patient. These cases are slow to return to normal. You must consider the general condition of the patient and whether or not you are getting amelioration of your symptoms. Treatment should be done energetically, and I do not see any necessity in these cases for waiting two weeks, except that it is more difficult to catheterize the bladder in the first few days postpartum.

DR. K. ISADORE SANES, PITTSBURGH, PENNSYLVANIA.—I would like to ask Dr. Baughman (1) whether all these cases showed ureteral kinks with dilated pelves, (2) whether the patients might not have had dilated pelves with ureteral kinks complicated by pregnancy, rather than pregnancy complicated by pyelitis, ureteral kinks and dilated pelves.

The pyelitis pictures, like the ones shown by the essayist, we frequently see, as Dr. Furniss remarked, in gynecologic work. If such a pyelitis patient gets pregnant, the obstetrician may attribute the pyelitis to the pregnancy. Pyelitis, however, may also occur as a complication of pregnancy. Whether preceding

pregnancy or developing during it, pyelitis frequently gives rise to serious disturbances and requires treatment. All of us have frequently observed the fall of temperature and the disappearance of pyuria after the first renal catheterization. It is a question, therefore, whether renal lavage is necessary. In our practice we do not subject our patients to renal lavage unless we are satisfied that catheterization of the kidney alone cannot give relief.

DR. BAUGHMAN (closing).—In regard to Dr. Polak's point, I can only say that we very seldom get rid of the bacteria. The patients feel well, and they therefore do not come back very often for treatment or for observation. We find bacteria in these cases persisting for months and months.

In regard to the substances with which the kidney pelvis should be irrigated, I think silver nitrate is distinctly the best. We have had some good results with mercurochrome. In one of these cases, following a severe reaction with silver nitrate, we tried mercurochrome, and it was very satisfactory.

In regard to the point as to whether these cases have a kink beforehand or whether it is the result of pregnancy, I have no way of saying. They may have been potential pyelitis cases before pregnancy, but we did not learn about pyelitis until after they were pregnant.

In regard to drainage, I had to make my remarks so brief that I was not able to say what I would like to say. Our idea in regard to the treatment of these cases is that drainage is the important thing. We use hexamethylenamine water to increase drainage, also drain with the catheter, leaving it in place where there is an indication. I want to emphasize the point brought out by Dr. Polak that you cannot always get drainage simply by having patients in the Fowler position. We turn them in bed in every possible manner, and know they are draining when they say that they feel much better.

BENIGN MAMMARY TUMORS AND INTESTINAL TOXEMIA

By Commander William Seaman Bainbridge, M.C., U. S. N. R. F.,
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THE present paper purposes to record a series of twenty-five cases of abnormal mammary changes apparently caused by autointoxication. When these cases are seen in their early stages the breast condition is often overlooked; when they have developed into a more easily recognized state, frequently a diagnosis of malignant disease is made.

Each of the cases reported herein suffered from a coexistant chronic intestinal toxemia, and the amount of poisoning was reflected, in many instances, in the degree of change in the mammary tissue. When the autointoxication was relieved the breasts either markedly improved or returned entirely to the normal.

These cases classify themselves, more or less, into three groups. 1. Those with a condensation or lobular induration of the upper, outer quadrants of the breasts, usually along the edge of the large pectoral muscle, and where the dependent breast drags on the upper axillary margin. This occurs in both mammæ, but more frequently in the left. Such terms as "toxic breasts," "lumpy breasts" or "stasis lumps" are descriptive of this condition. 2. Those cases that have, in addition to the above, and in the same region, localized degeneration with adenomata or cystomata. 3. Those that have an abnormal discharge from the nipple in conjunction with one or the other of the above conditions.

The diminishing of the gastrointestinal fermentation by diet, digestives, intestinal antiseptics, high alkaline colonic irrigations, and certain physiotherapeutic measures, is of distinct value. The use of these agents, together with a support to the breasts and a proper uplifting abdominal corset, often result in a complete disappearance of the breast lumps or tumors. However, some of the cases require surgical intervention of the underlying abdominal condition before the toxic poisoning is sufficiently relieved as to noticeably benefit the breasts.

In those cases where there is a cyst or adenoma in addition to a general lobular condition of the breasts, the removal of the growth and the correction of the intestinal stasis, by medical or surgical means, often result in the mammæ becoming completely normal. A preliminary lessening of the general toxic condition, in some cases, materially helped in locating the real existing benign neoplasm, and hence it was made possible to save a considerable amount of curable breast tissue. By this means the patients were saved the mental and physical shock of an unnecessary amputation.

The majority of the following cases had marked chronic intestinal

toxemia without any apparent accompanying pelvic disorder; a few had, in addition, complicating pathology: Five cases were cured without operation. Fifteen cases were cured by surgical relief of the chronic intestinal stasis, without operative interference of the mammæ. One case was cured by the removal of an adenoma from a generally lumpy breast, with an abdominal section for the underlying intestinal pathology. Three cases were cured by the removal of an adenoma or cystoma from a toxic breast, and by the preliminary and the after-treatment for the intestinal toxemia. One case is that of toxic breasts which had been removed; the underlying condition not having been recognized.

CASE 1.—I. I.; age thirty-five; female; single. First seen May 12, 1919. Constipation with usual symptoms of intestinal stasis; backache. On examination, found floating right kidney; general enteroptosis; mass of feces in lower colon; considerable gas in ascending and transverse colon; marked lumpy condition in upper, outer quadrant left breast. Prescribed tonic, laxatives, uplifting corset belt; special abdominal exercises, and general hygienic regime. June, 1920: Patient in excellent health; constipation relieved; no longer any lumps in breast. September 1920, passed examination to enter training school for nurses of large metropolitan hospital.

CASE 2.—E. S.; age thirty-three; female; single. First seen September, 1898. Marked constipation; frequent attacks of intestinal gas; distinct lumps in upper, outer quadrant of left breast; nipple normal. Very much worried about cancer. Prescribed diet, cathartics, and support to breasts, with very careful and frequent examination. Six months after treatment was begun lumps in breasts disappeared. For some years, patient noticed that if she became constipated and had "indigestion," there was a return of the lumpy condition. This was relieved by thorough catharsis. August, 1920: Breasts perfectly normal.

CASE 3.—J. L.; age thirty; female; single. First seen January, 1919. Subacute attack of rheumatic fever; feet extremely swollen; painful; intestinal indigestion; headaches; nausea; marked constipation. On examination found intestinal stasis; large lumps in both breasts; enlarged glands of neck; swelling of feet and ankles. Prescribed diet; high alkaline colonic irrigations; salicylates, for a short time, cathartics, with physiotherapy as able to take it. September 1920: Under treatment, swelling and pain in joints of feet and elsewhere gradually disappeared. Lumps in breasts entirely gone after two months. Twice she allowed herself to become constipated and to be indiscreet with diet and at both times noticed a soreness and distinct lumpy condition of breasts, which disappeared upon resorting to careful treatment.

CASE 4.—W. R.; age twenty-eight; female; married. First seen November 27, 1906. Rectal abscess and cyst of perineum removed. In 1919 complained of intestinal gas; loss of weight; constipation; soreness of breasts, worried about cancer. On examination, found gastroptosis; ascending colon and hepatic flexure clogged with fecal matter; considerable gas; distinct lumpy condition throughout breasts, more marked in upper, outer quadrant. Prescribed abdominal and breast supports; laxatives; high alkaline colonic irrigations several times a week; diet; tonic; special exercise. June, 1920: Patient stated she was no longer a "nervous wreck"; when careful of diet and bowels there is no soreness in breasts. Considers herself well. August, 1920: Excellent condition; breasts normal.

CASE 5.—A. G.; age forty-eight years; female; married. First seen December 9, 1918. Complained of pain and discomfort in left breast. On examination, found breasts very large, dependent, and the inner quadrant of left one slightly lobulated; no real tumor formation. Prescribed breast support; laxatives, with usual hygienic

regime and careful watching. June, 1920: Lumpy condition of breasts entirely relieved—still a little soreness; constipation improved.

CASE 6.—A. B.*; age twenty-five; female; widow. First seen February 23, 1916. March, 1915, severe pain right iliac fossa; morphine prescribed; several recurrences; constipation. Since August, 1915, constant bloody discharge from left breast; later distinct lump developed. Radical amputation advised by several surgeons. Diagnosis of cancer made by several of them. On examination, found distinct tenderness right iliac fossa; abdominal gas; lumpy condition in upper quadrant of left breast; on deep pressure, nipple exuded bloody serum. Advised surgical interference for abdominal condition and that breast be kept under careful surveillance. Operation, March 11, 1916: Large, pendulous cecum; dilated terminal ileum; incompetent ileocecal valve; many abdominal bands and adhesions. Conditions corrected. (See Fig. 1.) August, 1920: Excellent general condition; breasts normal; no discharge since sixth day after operation. One month previous to my examination she saw a physician in the South who pronounced her "100 per cent perfect."

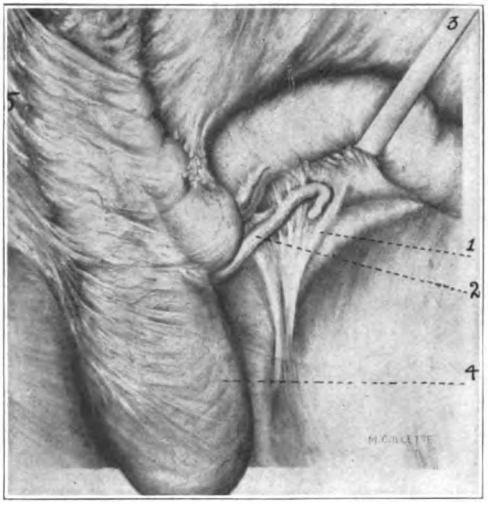

Fig. 1.—*1.* Ileopelvic band. *2.* Kinked appendix attached to ileopelvic band. *3.* Blunt retractor holding ileum upward. *4.* Pendulous cecum. *5.* Pericolic bands, so-called "Jackson membrane."

CASE 7.—C. H.†; age forty-one; female; married. First seen May 27, 1914. For a year enlarged right breast with constant pain; amputation advised by several surgeons. For many years attacks of pain in regions of stomach and appendix. On examination, found dependent, lumpy breasts; nipples not retracted; pain over epigastrium on pressure; chronic appendix; intestinal stasis. Advised surgeon who referred patient for an opinion, to operate upon abdomen and to keep breasts under observation. Abdominal operation performed and diagnosis confirmed. No breast operation. June, 1920: Report by surgeon—patient's general health good; breasts normal.

CASE 8.—C. C.‡; age twenty-two; female; single. First seen March 1, 1913. Marked neurasthenia; constant nausea; vomiting and dizziness. No satisfactory improvement after nine months medical treatment under care of gastrointestinal specialists. On examination found enlarged stomach; visceroptosis; mobile cecum; distinct chain of lumps extending down axillary line into substance of breasts. Operation,

*Case reported in part, in Woman's Med. Jour., May, 1917.
†Case reported in part in: Conservation of Human Breast, Internat. Jour. Surg., July, 1915.
‡Case reported in part: Am. Jour. Obst. and Dis. Women and Children, February, 1917.

March 12, 1913: Marked enteroptosis; drag on duodenum by bands to transverse colon; mobile cecum, acting as bucket to retain fecal matter, dragging on posterior wall of abdomen, pulling over peritoneum and hanging into true pelvis; many abdominal bands and adhesions. Conditions corrected so far as possible. (See Fig 2.) Advised abdominal support and light brassiere for a time, with careful observation of breasts. July, 1920: Breasts perfectly normal; no nausea or vomiting; excellent physical and mental condition.

Fig. 2.—*1.* Ileal obstruction by bands. *2.* Adherent and kinked appendix. *3.* Mobile cecum. *4.* Thickened portion of mesocolon along line of mechanical stress.

CASE 9.—G. W.; age thirty; female; married. First seen January 25, 1917. For many years acute attacks of "indigestion" with pain in left side; vomiting; fever; headaches; abdominal gas; loss of weight. On examination, found lumpy condition in upper, outer quadrants both breasts; chronic intestinal stasis. Operation, February 12, 1917: Great omentum adherent to right lateral wall of abdomen; two bands across duodenum, one to pylorus and other to transverse colon; band of adhesions twisting junction of small and large bowel; rotating and mobile cecum with diverticulum; tense band from posterior wall of abdomen attached to bowel, causing point of obstruction. Conditions corrected. (See Figs. 3 and 4.) July, 1920: Patient in

Fig. 3.—*1.* Stomach. *2.* Dilated first portion duodenum. *3.* Gall bladder held up by rubber covered forceps. *4.* Liver. *5.* Bands across duodenum from gastrocolic omentum to liver.

excellent condition; pain, indigestion, vomiting, etc., relieved; breasts normal; lumps entirely disappeared.

CASE 10.—H. K.*; age twenty-five; female; single. First seen April 10, 1916. In 1914 had appendix removed; lost twenty-three pounds since then; troubled with gas; nausea; vomiting; abdominal discomfort; "at times kidneys do not work for a whole day." On examination found diffuse psoriasis of extremities and body; abdominal gas; dilated and prolapsed cecum; tenderness over terminal ileum; lumpy breasts. Operation, April 14, 1916: Adhesions from apex to base of gall bladder, indenting duodenum; extending towards stomach; band from transverse colon, almost causing obstruction of duodenum; duodenojejunal kink; dilated duodenum;

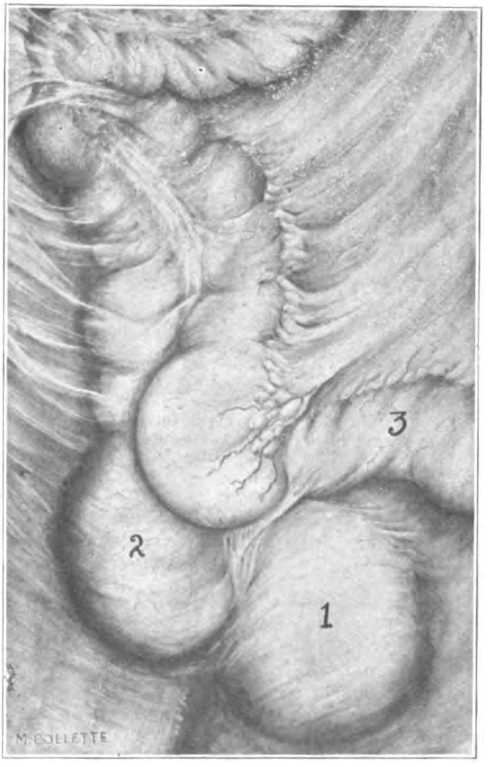

Fig. 4.—*1.* Cecal diverticulum. *2.* Rotated, mobile cecum. *3.* Ileum.

band across ascending colon causing partial obstruction; mobile and dilated cecum. Operative conditions corrected. (See Figs. 5, 6, 7.) July, 1920: Patient reported by letter from Coblenz, Germany. Physical condition most satisfactory; lumps in breasts entirely gone; psoriasis improved, but persists.

CASE 11.—J. M.; age forty-two; female; married. First seen October 5, 1917. Pain in back and right, lower abdominal quadrant; tenderness in epigastrium; usual symptoms of intestinal toxemia with constipation. On examination found uterine

*Case reported in part, in Medical Record, and Medical Press and Circular, London, April, 1920.

Previously, I have reported cases of like nature, where the clinical symptoms simulated attacks of gallstones or acute inflammation of the gall bladder. Release of the band as shown in above drawing completely relieved symptoms. It is gratifying to observe that since I have applied "pseudocholelithiasis" and "pseudocholecystitis" as entities, others have been employing the same terms.

polyp; cystocele; perineal laceration; chronic appendix; ileal stasis; marked lumpy condition upper, outer quadrant left breast. Operation, October 11, 1917: Chronically inflamed and kinked appendix; adhesions around great omentum and gall bladder. Pelvic and abdominal conditions corrected. July, 1920: Excellent physical condition; constipation much improved and easily controlled by mild laxatives; no longer any lumps in breast.

Fig. 5.—*1*. Stomach. *2*. Gall bladder elevated by forceps. *3*. Exposed band from base of gall bladder, across to and indenting duodenum, and attached to transverse colon below. Traction on transverse colon caused kinking and twisting of ducts, resulting in retention of bile in gall bladder. *4*. Transverse colon.

Fig. 6.—*1*. Band across ascending colon causing partial obstruction. *2*. Mobile, dilated cecum. *3*. Blunt retractor holding up dilated ileum. *4*. Early stages of development of an ileopelvic band.

CASE 12.—Van B.; age twenty-six; female; married. First seen August 18, 1919. For many years "stomach trouble with bilious colic"; attacks of pain right upper quadrant of abdomen, extending to back; recently more marked and more frequent. On examination found dilated gall bladder; chronic intestinal stasis; lumps in upper, outer quadrants both breasts. Operation, September 19, 1919: Adhesions and bands right upper quadrant corrected; inflamed and thickened gall bladder with stones

in cystic duct removed. Patient's condition was such it was deemed inadvisable to attack right lower quadrant. Prescribed uplifting corset; diet; cathartics. July, 1920: Patient free from attacks of abdominal pain; stasis symptoms relieved; breasts normal; lumpy condition disappeared; gain of weight; general condition greatly improved.

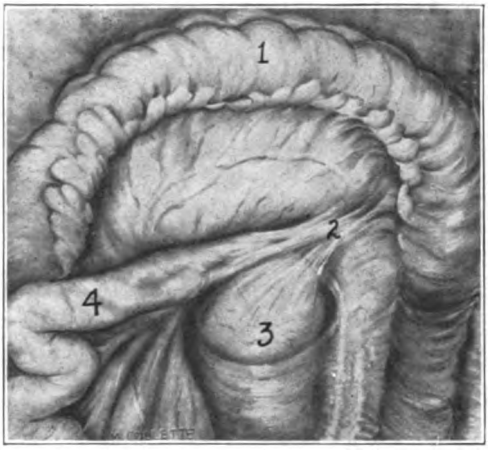

Fig. 7.—*1.* Transverse colon held up, exposing under surface of transverse mesocolon. *2.* Duodenojejunal kink. *3.* Dilated duodenum. *4.* Jejunum.

CASE 13.—M. G.; female; single. First seen March 2, 1916. Typical symptoms of chronic intestinal stasis. On examination, found patient anemic; abdominal gas; enteroptosis; intestinal stasis; enlarged and retroverted uterus; tenderness over left ovarian region; breasts lumpy at outer quadrants. Operation, March 10, 1916: Band from transverse colon to gall bladder; enlarged cecum with retrocecal pouch; appendix adherent to wall of diverticulum; last loop of colon fixed in abnormal position by

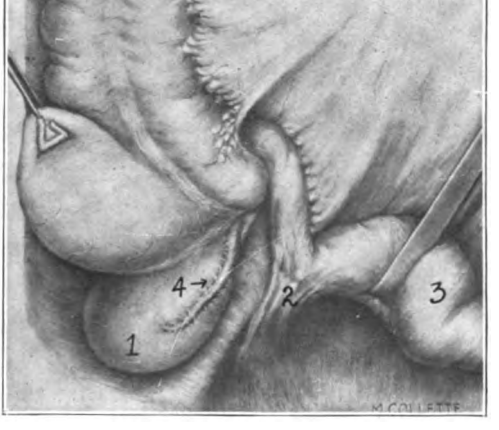

Fig. 8.—*1.* Retrocecal pouch. *2.* Ileopelvic band. *3.* Dilated ileum held up by blunt retractor. *4.* Adherent appendix.

bands; retroverted uterus. Conditions corrected. (See Fig. 8.) August, 1920: Excellent physical condition; breasts normal.

CASE 14.—H. S.; age thirty; female; single. First seen November 12, 1915. Patient stated she had stomach trouble twelve years; frequent vomiting; lump in pit

of stomach; constipation; headaches. On examination found distinct lumpy condition in upper, outer quadrant right breast; resistance over epigastrium; head of colon tender; marked abdominal gas. Operation, February 25, 1916: Strong band from transverse colon to gall bladder; constriction at duodenojejunal angle caused by band; ileopelvic band with appendiceal tie; dilatation ascending colon; dilatation and rotation of cecum. Conditions corrected. July, 1920: Markedly improved; breasts free of lumpy condition; normal.

CASE 15.—L. S.; age thirty-seven; female; single. First seen May 6, 1907. Complained of hardening and lumpiness of right breast. Advice given as to support of breasts and constipation. In 1916 returned for treatment complaining of discharge of milky serum from both nipples; many lumps throughout breasts; marked leucorrhea and excessive bleeding at periods. On examination found breasts very lumpy with a number of seeming cysts in both mammæ. Large fibroid mass in uterus. Operation, December 27, 1916: Panhysterectomy for multiple fibroids; appendectomy; large, sacculated cecum plicated. Milky secretion in both breasts removed. No breast operation. May, 1920: Patient in good condition; no mammary discharge; breasts normal.

CASE 16.—C. H.; age thirty; female; single. First seen June 16, 1915. Beginning epileptic seizures nine years ago continuing off and on since; more frequent at present time; dizziness; dysmenorrhea. On examination found terminal ileum tender; upper quadrant of left breast lumpy; uterus congested and retroverted. Operation, July 1, 1915: Appendix removed; uterus stitched forward. July, 1920: Excellent condition; no epileptic seizures last four years; lumpy condition of breasts entirely relieved. Embraced Christian Science some months after operation and gives full credit to this form of treatment.

CASE 17.—A. S.; age thirty-two; female; single. First seen July 30, 1919. Six years ago developed severe backaches; palpitation; gas; abdominal pain; marked constipation and lumps in breasts. Operation, August 2, 1919: Abdominal and pelvic adhesions; right ovary fibroid and cystic; adherent appendix; stasis. Conditions corrected. (Note: Had previous laparotomy in 1917.) August, 1920: Twenty-seven pounds gain in weight; marked improvement in physical condition; constipation practically corrected; no longer any lumps in breasts.

CASE 18.—H.C.; age forty-three; female; married. First seen January 10, 1917. In 1905 had operation for acute appendicitis with abscess; since then troubled with gas, headaches; constipation. October 1916, sudden attack of indigestion; pain through back; severe vomiting. On examination, found tenderness over gall bladder; slightly enlarged liver; intestinal stasis; breasts somewhat lumpy. Operation, February 14, 1917: Great omentum thickened and tightly adherent to old wound; cecum rotated and anchored into right side; terminal ileum tightly adherent to posterior abdominal wall; gall bladder fastened to duodenum by bands; fifty-two gallstones; many abdominal bands. Operative conditions corrected as far as possible. August, 1920: Bowels regular; excellent physical condition; no lumps in breasts.

CASE 19.—W. L.; age thirty-four; married; female. First seen November 3, 1909. Complained of pain in abdomen; gas; constipation; nervousness. These symptoms followed operation in 1905, for appendicitis. On examination found large tumor of uterus; movable right kidney; dilated stomach; lumpy condition of breasts. Operation, April 16, 1913. Cecum distended; adherent to right parietal wall, to transverse colon and to peritoneum of right iliac fossa; cystic right ovary; fibroid tumor of uterus; abdominal adhesions. Operative conditions corrected; uterine tumor excised. (See Fig. 9.) August, 1920: General condition good. Lumpy condition of breasts entirely gone.

CASE 20.—M. D.; age twenty-six; female; single. First seen November 30, 1915. Troubled with pain in right side; abdominal gas; nausea; marked constipation. Appendix previously removed. On examination, found full, baggy abdomen; large mass in cecal region; lumpy condition in upper, outer quadrant of breasts. Operation, November 30, 1915. Mobile cecum; ileopelvic bands; ileal stasis; transverse colon adherent to ascending colon; band in sigmoid with ovary attached. Conditions corrected. July, 1920: Very well except for dysmenorrhea and at times slight constipation. Breasts normal.

CASE 21.—G. U.; age 28; female; single. First seen April 3, 1915. Usual symptoms of intestinal toxemia; lump in right breast with pain. On examination, found distinct movable tumor, in the inner lower quadrant of right breast, with general lumpy condition of both breasts. Sent to me as cancer of the mamma. Advised early removal of definite tumor, and usual antitoxic treatment. Consented to operation February 9, 1917, and two fibroadenomata were removed from right breast. General treatment was continued as condition of patient was poor. At later operations removed tonsils and adenoids, and diseased right ovary with cystic tube, chronically

Fig. 9.—*1.* Ileopelvic band. *2.* Mobile, displaced and twisted ascending colon. *3.* Bands kinking and attaching cecum to colon. *4.* Dilated cecum. *5.* Portion of appendix left after appendectomy—(1905).

diseased appendix and a twenty-pound fibroid tumor. April, 1920: Patient in excellent health; lumpy condition of breasts entirely disappeared.

CASE 22.—C. B.*; age thirty-seven: female; married. First seen February 26, 1914. In November, 1912, noticed small lump right breast; left breast sore; constipation; symptoms of intestinal toxemia. Lump in breast gradually enlarged; declared malignant by surgeon consulted. On examination, found diffuse lumpy condition both breasts; indefinite mass lower, outer quadrant right breast; nipples not retracted. Prescribed usual regime for intestinal toxemia, and kept breasts under careful observation. March 21, 1914: Tumor mass stood out clearly, the surrounding induration having greatly diminished. Operated, removing fibroadenoma, which was proved by pathologic examination. July, 1920: Patient in good health; complete disappearance of lumpy condition of breasts.

CASE 23.—C. G.; age thirty-seven; female; married. First seen March, 1908. Both breasts distinctly lumpy with three cysts in right one; typical symptoms of intestinal toxemia. Cysts removed, and treatment instituted for constipation and

*Case reported in part in "The Cancer Problem," p. 292.

toxemia; urged importance of frequent examination of breasts. Breasts returned to normal and patient remained well until June, 1920, when an acute attack of muscular rheumatism, preceded by a prolonged period of constipation, brought to her attention a few small lumps in left breast. Patient fearful of cancer. On examination, found right breast normal; slight lumpy condition in upper, outer quadrant of left breast; no glandular involvment. Reassured patient concerning cancer, and tonic, laxatives and uplifting corset prescribed. July, 1920: Bowels easily regulated with laxatives; both breasts normal; lumps entirely gone.

CASE 24.—E. F.; age thirty-nine; female; married. First seen November 24, 1916. Intestinal indigestion; constipation; gas; lumpy breasts; feared cancer. On examination found tenderness over pylorus; chronic intestinal stasis; lacerated cervix; general lumpy condition both breasts with distinct tumor mass upper, outer quadrant each breast. Operation, December 4, 1916. Divulsion and curettage; repair of cervix; cyst removed from right breast. Pathologic report indicated benign condition of cyst; therefore, it was decided not to remove an apparent tumor from left breast, but to keep patient under close observation and treat without surgical intervention. Prescribed usual treatment for intestinal toxemia with support for breasts. June, 1920: Breasts perfectly normal; no lumps; no pain; constipation relieved; intestinal condition markedly improved.

CASE 25.—I. S.; age twenty-nine; female; single. First seen March, 1920. Always troubled with constipation. In June, 1918, lump appeared in lower quadrant left breast; consulted two surgeons both of whom advised radical operation. September, 1918, discovered lump in right breast. December, 1918, both breasts removed, nipples left. Report of pathologist—No malignancy. Consulted me for painful condition of chest wall along line of scar; "feared return of cancer." On examination, found deforming scars; region of breasts negative; clear case of stasis. Prescribed tonic; laxatives; diet, etc. Reassured as to any cancerous condition. September, 1920: With the correction of constipation and reduction of acid-producing diet, patient very much relieved mentally and physically.

SUMMARY

1. There are definite abnormal changes in the breast tissue, as in the thyroid gland, from intestinal toxemia.

2. Treatment by medical and mechanical means, or surgical intervention for the cure of the intestinal stasis, often means complete return to the normal of the lumpy or toxic breasts.

3. At times it is necessary to remove a definite, localized tumor from the breast, in addition to the above, before the mammary tissue regains its normal texture.

4. Care must be taken that these abnormal changes are not overlooked in their early stages; and not diagnosticated as cancer when well developed.

5. In this connection, an important question must be noted: Would an early recognition of a toxic breast and timely and efficient treatment of the underlying intestinal causes, tend to lessen the danger of malignant degeneration? If this is so, then we have here an important contributory factor in the etiology of cancer of the breast.

DISCUSSION

DR. JAMES E. DAVIS, DETROIT, MICHIGAN.—This paper brings before us a principle that can be applied not only in benign tumors but also in malignant growths. I do not think Dr. Bainbridge has emphasized malignant changes so much as the benign. The changes in tissue fundamentally must fall back upon change of metabolism. In the entire process of metabolism one has to bear in mind the following steps: First of all, there is the preparation of the food which has an influence upon the psychic stimulation of secretions. Next, a mechanical division of the food, then the digestion, and what other changes there are in bringing the food to what we call proximate principles. When in the form of proximate principles it is before the epithelium of the intestinal tract and ready to commence with the metabolic processes proper. Anabolism proceeds in building the tissue and catabolism separates the products that are left over. In order to have a tissue perfectly formed, there must be a correct anabolism. To maintain healthy tissue we must have correct catabolism. In the conditions which Dr. Bainbridge has so forcibly pictured, all of these conditions are interfered with, and the tissues cannot be properly made into their normal structures, neither can they be maintained in health. Therefore not only in dealing with the benign growths, but also with malignant growths, it is very well to bear in mind that we must look well to the entire process of metabolism, so that there are no interfering factors. It is a well-known fact that a considerable number of malignant growths that have been definitely proved as such have been cured without any artificial interference. The body has been able to cure these absolutely by metabolic means.

DR. FRANCIS REDER, ST. LOUIS, MISSOURI.—It has occurred to me in listening to Dr. Bainbridge's paper, whether these conditions of intestinal toxemia are centered clinically from the very first upon the breast, or whether these clinical manifestations merely direct attention to the abdominal viscera. A thorough examination of the abdominal organs, especially those in the pelvis, should be made, before a definite expression is ventured on the breast condition. I am inclined to think that a breast pain in connection with intestinal toxemia can be readily recognized as to its pathology clinically and should, therefore, receive only secondary consideration. However, there are many physicians who get overanxious whenever a woman complains of pain in her breast and are inclined to overlook conditions elsewhere and center their attention solely on the breast. I may cite one instance in which the pain in the left breast became so pronounced that a doctor deemed it wise to have the breast amputated. No distinct mass or lump could be felt, the breast, however, was removed on account of pain. A similarly painful state manifested itself in the right breast. I was called in consultation, and in making an examination of the woman, an ovarian cyst, right sided, was discovered. With the removal of the cyst, and it took considerable persuasion to get the consent of the patient for operation, the pain in the right breast disappeared.

I have since had five or six cases of pelvic tumor with associated breast pains that went unrecognized, where the breasts came very near being sacrificed.

DR. CRILE.—How do you deal surgically with stasis?

DR. BAINBRIDGE.—I consider the gastrointestinal tract as a hollow tube, and wherever there is a kinking or twisting which is abnormal in nature, causing definite symptoms that cannot be relieved by medical, mechanical, dietetic, physiologic, therapeutic or any other means, after due consideration, I open the

abdomen and make a careful survey, and where the bands are causing definite obstruction and preventing natural drainage, I correct the conditions. I have preached that for a long time. Take the proposition as you have it. Is that tube functioning? Does the alimentary canal act sufficiently proper as a human plumbing plant? If it does not, we want to correct it in one way or another. I believe in a fair trial of a reasonable amount of conservatism before radical intervention; and with surgical intervention we do not rely strictly on finger-tip work in a small abdominal area, but observe the whole field carefully and then do whatever seems best in the judgment of the operator.

We must remember that there may be definite kinks without any stasis, and there may be stasis without kinks. By stasis we mean that the passage of food along the alimentary canal takes place with such slowness that there is formed an excess of toxic matter, especially in the small intestine. Consequently, the blood flow pours into the transforming and excretory organs a quantity of poison larger than they can eliminate. From this it follows that all the tissues of the body, drenched in this blood rich in poisons, degenerate and offer a diminished resistance to infection. A defective drainage has consequences which are deleterious to the organism in general as well as to the individual tissues of which it is composed.

DR. VAN SWERINGEN.—How would you deal with cases of diverticulum of the cecum?

DR. BAINBRIDGE.—Some years ago, in the Naval Medical Bulletin, Vol. 9, No. 2, I described the technic of that operation. Plication and careful anchoring of the cecum, in most cases of moderate diverticulum, seem to give sufficient correction. If there is a retrocecal diverticulum, the method as described by Dr. Meeker in our Transactions several years ago, has proved of value. In cases where the cecum and ascending colon are very much dilated, and there are a considerable number of diverticuli with a mobile cecum, the method employed by Waugh, recently described in the *British Journal of Surgery* has been found useful. In very extreme cases where the muscular wall has been entirely atrophied, and the wall of the cecum is almost like tissue paper, excision of the cecum may be indicated.

I wish to thank Dr. Davis for his interesting pathologic viewpoint. We all know that malignant growths have disappeared, but the possible relationship with toxemia is most interesting.

I also extend my thanks to Dr. Reder. I have a paper ready for publication describing breast conditions which cleared up after pelvic toxic complications were relieved.

In closing, I wish to say that I am fully aware of the danger in all this teaching. On the floor of this Association last year, one man made this statement, in a discussion: "Wherever there is an appreciable lump in the breast, that breast should either be removed within forty-eight hours or a section of the tumor removed and examined microscopically." We believe thoroughly in a campaign of education; we want the laity to come early for examination. Such an unqualified statement coming from our Association is most dangerous. Patients have a right to expect from us a well poised judgment, careful and expert diagnosis, based on all the facts. We all realize the tragedy of permitting a patient to drift beyond the hope of surgical cure; but it is also a dire calamity to unnecessarily remove a woman's breast, which often brings to her a life of sorrow, as well as disturbs the cycle of the secretory system.

FIBROMA OF THE OVARY

By Edmund D. Clark, M.D., F.A.C.S., and William E. Gabe, M.D.,
Indianapolis, Ind.

FIBROMA of the ovary is a sufficiently rare condition to warrant the report of all carefully studied cases. Such tumors of the ovary were probably first mentioned by John Astruc in his lectures in 1740 at Paris, published in London in 1743: "Nevertheless, such tumors, and particularly scirrhous ones, are not very frequent in those organs" (the ovaries and tubes). Fullerton states that they were first discussed as early as 1749. A perusal of the statistics of large clinics or of men having extensive experience in pelvic surgery shows a surprisingly small number of true ovarian fibromata. The United States Army Medical Museum contains only eight specimens (Lamb). Sir Spencer Wells, in 1200 ovariotomies, found only three ovarian fibromata (Peterson). Kelly, in 1200 laparotomies, found four; and Loehlein in a series of 172 ovarian tumors found seven (Laidley). Thornton, in 500 cases of pelvic tumor, saw only three (Coe). Olshausen found six in a series of 293 ovarian tumors, while Orthman saw ten in 527. Hellman, in his excellent paper on the subject, reports six cases found out of a series of 4500 pathologic specimens covering a period of about ten years at the Frauenklinik of the Königliche Charité in Berlin.

We desire to report the following case:

E. C.; single; aged forty-six; was referred by Doctor Haws, of Advance, Indiana, for surgical treatment of a tumor in the lower abdomen. The family history is irrelevant. The patient had the usual diseases of childhood, and pneumonia at the age of twelve. She had occasional frontal headaches which were relieved by glasses at the age of thirty-two. Five years ago she had an attack of pain in the left lower quadrant of the abdomen. The pain was not exceedingly sharp and was not associated with vomiting, diarrhea, or constipation. She had with this attack some dysuria. Shortly afterwards she noticed a growth, a "hardness," as she expresses it, across the lower abdomen and that the latter was gradually increasing in size. Recently she had another attack of pain in the left lower quadrant of the abdomen and consulted her physician. He found a tumor to be present and referred her for surgical treatment. The patient's menstruation had been normal all her life, her periods starting at the age of fourteen and the menopause occurring five years ago, just before the onset of the present trouble.

Physical Examination.—The patient is fairly well developed and nourished. Aside from a few carious teeth and considerable pyorrhea, the head is negative. The heart, lungs and extremities reveal nothing pathologic. Palpation of the abdomen, over its lower part, reveals a mass about the size of an ordinary grapefruit situated a little to the left of the midline just above the symphysis pubis. There is some

tenderness present in this region. No demonstrable ascites can be made out. Bimanual examination shows this mass to be nearly spherical in shape, freely movable, and of quite firm consistency. The uterus cannot definitely be made out.

A blood count showed white cells, 7,000; hemoglobin, 85 per cent; red cells, 4,600,000; differential count, polynuclears, 75 per cent; small lymphocytes, 17 per cent; large lymphocytes, 8 per cent. Urine was clear, acid; specific gravity 1.020; sugar, absent; albumin, faint trace. Microscopic examination shows considerable bladder epithelium and an occasional pus cell and red-blood corpuscle. Patient's

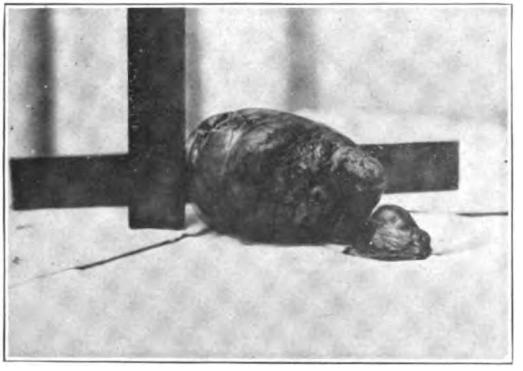

Fig. 1.—The tumor in gross. The uterus is seen as a small body lying at one side of the tumor and connected with it by the tube and broad ligament.

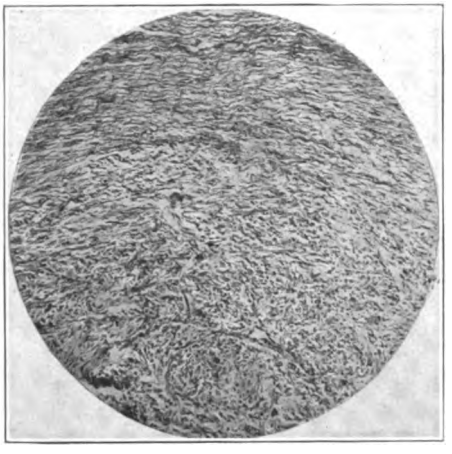

Fig. 2.—Low power; showing infiltration of lymphocytes, indicating beginning degeneration.

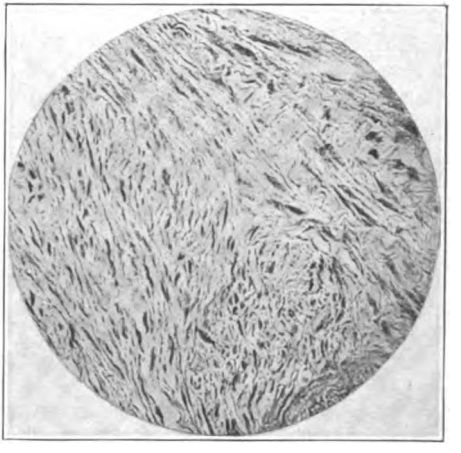

Fig. 3.—High power; showing newly formed connective tissue and occasional smooth muscle fibers.

temperature, 98.6° F.; pulse, 65; respirations, 15; systolic blood pressure, 120; diastolic, 84.

Operation February 28, 1920. Under ether anesthesia, after gas-oxygen induction, the abdomen was opened through a midline incision extending from the umbilicus to the pubes. The uterus was small and atrophic, situated a little to the right of the midline, deep in the pelvis. The pelvis was filled for the most part by a firm, smooth, spherical mass occupying the position of the left ovary. There was some free fluid in the abdominal cavity. A supravaginal hysterectomy and left salpingo-oophorectomy were done in the usual way. The appendix was removed as

an incidental measure, and the abdomen closed in layers. The patient was in good condition at the end of the operation.

Pathologic report of Dr. J. H. Warvel: The tumor in the gross was nearly spherical; of firm consistency, with well-developed fibrous capsule. A short section of the tube joined the tumor to the uterus, which was very small. The other ovary is enlarged and cystic. Microscopically, the section of ovary showed a rather loosely connected fibrous tissue. The nuclei of many of these cells being lost. There was no evidence of mitosis. Some areas showed a degeneration of the connective tissue with an infiltration of lymphocytes. All ovarian tissue was lost. The tumor is quite vascular. Diagnosis: Fibroma of the ovary. (See Figs. 1, 2 and 3).

A rather extensive investigation of the literature on the subject of ovarian fibroma reveals three outstanding papers; namely, those of Coe, 1882; Peterson, 1902; and that of Hellman, 1915. Mention might also be made of a book on ovarian tumors by Peaslee, published in 1872, in which a section is devoted to this subject. The remainder of the literature, however, consists chiefly in reports of single cases, and unfortunately, often without microscopic examination of the tumor. It has been repeatedly emphasized that the diagnosis of such a tumor as an ovarian fibroma should be made by a competent pathologist only after a painstaking microscopic examination. The literature contains several case reports in which the tumor is diagnosticated as an ovarian fibroma merely upon its gross appearance and hardness, while other reports describe tumors diagnosticated as fibroma before microscopic section, only to show some form of sarcoma, adenofibroma, etc., after section was made. Pure fibromata *per se* are considered here.

Considering the infrequency of the condition, deductions regarding the etiology, symptomatology, diagnosis, prognosis and treatment, as well as the pathology, must necessarily be made from reports in the literature in lieu of extensive personal experience. Coe has called attention to the fact that ovarian fibromata are either absolutely ignored in textbooks or else passing comment is made as to their rarity or obscurity and nothing else is said about them. This is true of many French writers as Edis, Gallez, Courty, Becquerel, and Nonat. Among the German writers, Leopold, Scanzoni, Bigel, Olshausen, Schroeder, Virchow, Rokitansky, Klebs, Rindfleisch and Klob have either reported cases or discussed the subject, especially from the pathological aspect. Among American writers, Churchill, Goodell, Sims, Emmett, Atlee, Peaslee, Thomas, Laidley, Fullerton, Peterson, and Hellman have especially called attention to the condition.

Ovarian fibromata comprise approximately two per cent of all ovarian tumors (Hellman and Reel). They occur from the time of puberty to an advanced age, the youngest reported being in a girl of seventeen years (Hellman's case), while the oldest was in a woman of seventy-three (McCann). The majority occur in single women and around the menopause. Cases have been reported complicating pregnancy (Carstens). Peterson in 1902 remarked their occurrence in whites exclusively; but Dickenson, in Goffe's paper two years later, cites a case of

ovarian fibroma removed from a negress. The size and weight of these tumors as reported in the literature vary extremely, the smaller ones being found completely enclosed within ovarian tissue, while the larger ones reach the weight of fifty-six pounds (Simpson), or even forty kilograms (Clemens). Virchow states that the size of true ovarian fibromata varies from that of a hen's egg to a child's head.

The etiology of these tumors always has been, and still is, obscure and much has been written pertaining thereto. The widely divergent views of many pathologists and surgeons are given in Hellman's paper. An origin in the corpus luteum is attributed by Scanzoni, Rokitansky, Klebs and Schauta. Hemorrhage into the ovary as an etiologic factor is given by Brothers, Kroemer, and Koeberle. Kiwisch, Virchow, Klob, Peaslee and Olshausen assert an inflammatory origin. Hellman thinks the tumor must come from connective tissue which may be found in five places in the ovary: first, the stroma of the ovary; second, the corpus luteum; third, the corpus fibrosa; fourth, in organized blood clots, and fifth, in the capsule of the ovary. He feels this sudden increase in normal connective tissue elements to be due to, first, inflammation, mechanical, as hemorrhage or hyperemia; second, bacteria, as follicle infection; third, scirrhotic, from retrogressive changes at the menopause; or fourth, possibly to some chemical action.

In the majority of the reported cases patients have complained of a swelling of the abdomen, pain of varying degree, often none at all, and not infrequently of feeling a hard mass through the abdominal walls. Other symptoms, such as frequency of urination, constipation, etc., are due to varying mechanical factors. Objectively, the tumor is usually palpated without difficulty. Its consistency, mobility, and unilateral occurrence are significant. One feature, however, is of marked diagnostic importance when present; namely, ascites. The weight attached to this finding has been especially emphasized by English writers on the subject. It may be recalled that fibroma elsewhere, and especially in the uterus, is rarely associated with ascites. The presence of ascites with intraabdominal carcinomatosis, located either primarily or secondarily in the ovary as a tumor mass, is common, but is associated with many other signs and symptoms not found in fibroma of the ovary. In other benign tumors of the ovary, ascites is usually lacking. It, therefore, seems of considerable diagnostic importance to find ascites together with a unilateral adnexal tumor in a case lacking signs of cachexia, great loss of weight, or symptoms pointing to a focus of malignancy elsewhere in the body, as in the breast or stomach. Hellman states that only 5 per cent of ovarian fibromata show ascites. When present, the collection of fluid may reach huge proportions, as in the case reported by Goodell, where repeated tappings were necessary for the relief of pressure. Olshausen believes such ascites to be due to mechanical causes (Hellman), a view shared by an anonymous

writer (1903) who thought the movement of the tumor in the abdominal cavity produced the fluid. However, secretion from the tumor (Schatzschen), hyperemia (Schauta), and a chemical origin (Pfannenstiel, quoted from Hellman) have also been advanced as causes.

In the absence of ascites, differential diagnosis from that of other adnexal tumors offers considerable difficulty. The tendency of ovarian fibromata to be unilateral, movable and hard, should be borne in mind. In the presence of ascites, where nephritis, cardiac decompensation, portal obstruction, abdominal carcinoma, tuberculous peritonitis, and the anemias can be ruled out, the occurrence of such findings should make one very suspicious of ovarian fibroma.

The treatment, without exception, is operation. The prognosis, as indicated from case reports, is excellent.

The pathology of ovarian fibroma has been carefully studied by several investigators. In fact, the literature consists chiefly of pathologic studies. Grossly, as already stated, maintains that these tumors vary tremendously in size. Their consistency, likewise, is extremely variable; some, composed of a loosely woven network of connective tissue, being soft; while others, as in the case reported by Sir Spencer Wells, require the use of a bone saw for their section. In a similar way their shape, appearance on cross section, color and general outline cover a wide range of possibilities. They show many forms of degeneration and it is on account of these as well as the possibility of a twisted pedicle, that their removal should be urged. The court of final judgment is the microscopic appearance of the tumor. Hellman insists that there must be a certain regularity of the individual fibers or muscle cells and strands, despite varying quantities of cells, fibers, vessels and degenerative changes. He found the cells in his case to be short and spindle-shaped with a slightly bent or pointed nucleus. Edema, necrosis, hyalin masses, and fatty changes are not uncommon. Several writers, especially Coe, have mentioned the occurrence of geodes, presumably dilated lymph spaces, which are seen in these tumors. Cases are reported also in which bone, cartilage and chalk have been found.

CONCLUSIONS

1. Ovarian fibromata are sufficiently rare to warrant the report of all carefully studied cases.

2. The diagnosis is dependent solely on microscopic examination.

3. In the presence of a hard, unilateral, movable tumor with ascites, where the more common causes of ascites can be ruled out, ovarian fibroma is highly probable.

4. The treatment is operative; the prognosis good.

5. The gross pathology of the condition is extremely variable; the microscopic pathology, as pointed out by Hellman, must show a cer-

tain regularity of the individual fibers or muscular cells and strands, despite varying quantities of cells, fibers, vessels and degenerative changes.

BIBLIOGRAPHY*

Astruc: Diseases of Women, London, 1743.
Bagot: New York Med. Jour., iii, p. 248.
Baldy: Am. Jour. Obst., xlvi. 850.
Becquerel: Maladies de l'Uterus, ii, p. 266.
Bissell: Am. Jour. Obst., xliii, 112. Ibid., xlviii, 362.
Boldt: Am. Jour. Obst., xlvii, 205. Ibid., xliii, 724. Med. Rec., New York, lxxxix, 666.
Bovee: Am. Jour. Obst., xlvi, 542.
Briggs: Brit. Med. Jour., lxxxvii, 1083. Lancet, London, March 9, 1902.
Brothers: Am. Jour. Obst., xli, 194. Ibid., 1, 104.
Campbell: Brit. Med. Jour., 1906, p. 695.
Carstens: Trans. Am. Assn. Obst. and Gynec., 1889, ii, 151.
Coe: Am. Jour. Obst., xv, 561-83; 858-79. Ibid., xxiii, 412.
Courty: Maladies de l'Uterus, p. 813.
Doran: Trans. Obst. Soc. of London, xxx, 410. Brit. Med. Jour., 1889, p. 1287. Trans. Obst. Soc. of London, xxxviii, 187. Ibid., xliv, p. 172.
Eden: Lancet, London, February 8, 1902, p. 349.
Edis: Diseases of Women, 1882, p. 282.
Emmett: Am. Jour. Obst., 1901, p. 237.
Fairbairn: Trans. Obst. Soc. of London, xliv, 177.
Gallez: Hist. des Kytes de l'Ovarie, p. 40.
Gemmell: Lancet, London, May 3, 1902, p. 1253.
Goodell: Am. Jour. Obst., xi, 152. Ibid., xv, 74.
Goffe: Am. Jour. Obst., l, 105.
Graham: Ann. Surg., xxxvii, 468.
Greig: Edinburgh Med. Jour., xvi, 444.
Hellman: Surg., Gynec., and Obst., xx, 692.
Henroten and Herzog: Am. Jour. Obst., xl, 789.
Hunner: Bull. Johns Hopkins Hosp., October, 1902, p. 251.
Hunter: Am. Jour. Obst., xviii, 1204.
Jones: Trans. Am. Assn., Obst. and Gynec., xxvi, 244. Am. Jour. Obst., lxviii, 906.
Klob: Pathological Anatomy of Female Sexual Organs, p. 1868.
Laidley: Am. Jour. Obst., xlii, 661.
Lamb: Washington Med. Ann., xii, 299.
Levin: Med. Jour. S. Africa, xi, 52.
Mallet: Am. Jour. Obst., liii, 100.
Manton: Trans. Am. Gynec. Soc., xxxv, 17.
Martin: Lancet, London, April 5, 1902, p. 968.
McCann: Brit. Med. Jour., 1903, p. 127.
Montgomery: Amer. Jour. Obst., xxi, 323.
Mundi: Amer. Jour. Obst., 1889, p. 282.
Nonat: Maladies de l'Uterus, p. 889.
Peaslee: Ovarian Tumors, 1872.
Peterson: Trans. Am. Gynec. Soc., xxvii, 264.
Pfannenstiel: Ref. f. d. Verhandl. d. Deutsch Gesellsch. f. Gynäk., xi.
Purslow: Lancet, London, 1887, p. 1398.
Reel: Am. Jour. Obst., lxxv, 400.
Rindfleisch: Zentralbl. f. Gynäk., 1906, No. 7.
Rokitansky: Wiener Med. Wchnschr., 1859, No. 34.
Royster: Am. Jour. Obst., xlvii, 262.
Sims: Am. Jour. Obst., xxix, 1265.
Sutton: Tumours Benign and Malignant, Chicago, 1903.
Swain: Brit. Med. Jour., December, 1904, p. 1737.
Thomas: Am. Jour. Obst., xii, 350.
Virchow: Tumours, 1867.

*Our thanks are due Miss Maude Nesbit, in charge of the medical department of the Indianapolis Central Public Library, for collecting the references in the bibliography.

Waldeyer: Arch. für Gyn., ii, 3.
Warren: Boston Med. and Surg. Jour., cxxviii, 10.
Wells: Trans. London Path. Society, x, 199.
Wiener: Am. Jour. Obst., lxxii, 209.
Williams: Trans. Am. Gyn. Soc., clxxxvii, 359. Philadelphia Med. Jour., December 29, 1900.

DISCUSSION

DR. OTTO H. SCHWARZ, ST. LOUIS, MISSOURI.—I was not under the impression that ovarian fibromata were as rare as the doctor stated. Ovarian myomata, however, are very rare. It has been very difficult for me to decide whether solid ovarian tumors which answer the description of fibromata were made up entirely of connective tissue or also contain some smooth muscle tissue. Recently I have observed three very interesting cases of fibroma of the ovary. In one instance a very large tumor about the size of a grape fruit arose from the ovarian ligament, slightly stretching the lower pole of the ovary. Directly opposite the site of the normal ovary on the surface of the tumor was a papillary excrescence which on section proved to be normal ovarian tissue. The structure of the tumor for the most part was connective tissue, but there was also definitely present some fibers of smooth muscle tissue.

Another case was a fibroma of the ovary about the size of a hen's egg which was definitely encapsulated. The surrounding ovarian tissue, very much thinned out, served as the capsule.

A third case was a small pedunculated fibroma arising from an otherwise normal ovary. The tumor measured 10x5x4 mm., and was similar to the normal ovarian cortex in structure. This case represented a fibroma in a very incipient state.

DR. ARTHUR T. JONES, PROVIDENCE, RHODE ISLAND.—I should like to add one more case of fibroma of the ovary to the literature. I think many of these cases are confused with sarcoma of the ovary. The first case that came to my notice I diagnosed as fibroma of the ovary. In that instance the pathologic examination proved it to be a sarcoma. Since then I have had five cases of which I have made note. In my opinion it is hard indeed to differentiate grossly between sarcomas and fibromas. This case that I diagnosed grossly as one of sarcoma, on pathologic examination proved to be a pure fibroma.

SECONDARY OPERATIONS: AN ANALYSIS OF ONE HUNDRED GYNECOLOGICAL CASES

By Edward Lee Dorsett, M.D., St. Louis, Mo.

THE question confronting men doing abdominal surgery, and especially gynecology, is whether or not the patient will be free from all her past symptoms, or whether there will be a recurrence or a continuation of her old trouble. This question, I think, applies much more to gynecology than any other department of surgery. The time is past when we can say: the patient has recovered from an operation; the important point is whether she will be free from those symptoms for which she was operated.

We are all too well familiar with those women whom we, or some other surgeon, have operated upon, presenting themselves with the same or a new set of symptoms following an operation upon some of the pelvic organs. When this has occurred a number of times, we begin to think that an error has been committed somewhere; perhaps a mistake in technic or diagnosis; the selection of the improper operation, or the wrong time in the progress of the disease; or, perhaps, a too radical or a too conservative operation.

A certain percentage of our gynecologic cases do not receive the proper preoperative treatment, nor the proper postoperative treatment after they leave the hospital. To this neglect are due some of the poor results which lead to a second operation. Of course there are a small number of cases in which poor results are obtained, due to causes over which we have no control, and for which we can hardly hold ourselves responsible.

It was after reading a most excellent paper by Dr. John O. Polak that it occurred to me to report these cases, but I have followed a somewhat different classification and with more minute detail. So many of these cases are interwoven with a complication of conditions that, in some instances, it is next to impossible to definitely separate them into distinct classes. There are, however, a number of definite conditions that stand out very markedly in each case, and these I have endeavored to tabulate under their respective heads.

In the one hundred cases here reported, twenty-two were operated upon, primarily, by the writer, the remainder by other operators. Eight women had three laparotomies, and two had four sections. In six cases that underwent three operations only two of them were laparotomies; and of two cases only one of the operations was an abdominal section.

In sixteen cases the first operation was not a laparotomy. The interval between operations varied from seven days to twelve years, but these figures have no bearing upon the cases, neither has the age of the patients, although both are noted in the case histories.

POSTOPERATIVE ADHESIONS

In those cases that had two or more laparotomies, sixty-seven were found to have adhesions. In a number of these cases it was impossible to tell whether or not they were the result of the previous operation, or due to the further advancement of a disease process.

1. Omentum adherent to peritoneal scar	53
" " " adnexa	3
" " " small bowel	7
" " " large bowel	2
" " " bladder	2
" " " inguinal canal	1
" " " uterus	10
2. Large bowel adherent to uterus	2
Small " " " "	6
Large " " " peritoneal scar	2
Small " " " " "	9
Large " " " adnexa	6
Small " " " "	9
3. Multiple adhesions (2 T. B. peritonitis)	13
Uterus adherent to parietal peritoneum	2
Appendix adherent to right adnexa	2

Glancing at these figures we are at once impressed with the fact that the greater number of these cases had adhesions between the greater omentum and the old scar in the parietal peritoneum. In the majority of cases the omentum was adherent directly to the scar; in a few, along either side. There is no doubt in my mind that the cause of this was due to two distinct conditions; i. e., poor technic and trauma. As Hertzler has stated in his magnificent work on the peritoneum, the rather old-fashioned way of using through-and-through sutures causes an irritation and trauma to the peritoneum which results in adhesions, due to retraction and turning-in of the peritoneal edges. In a number of cases operated upon a number of years ago, when this method was in vogue, there had been very extensive adhesions to the peritoneal scar. The present day method of using an over-and-over stitch to close the peritoneum is responsible for the formation of adhesions between the omentum and the scar; also the habit that some have of using tooth forceps to grasp the edges of the peritoneum when opening and closing the abdomen. Personally, I have adopted a continuous mattress suture, similar to the one advised by Jabez Jackson, that everts the peritoneal edges. I have had occasion to open the abdomen the second time in a number of cases in which this method was used and have noted the absence of any

adhesions where this procedure had been followed. The trauma caused by the use of the retractors and by the chemicals used in the sterilization of catgut, may also be responsible for this trouble. I am sure that the presence of iodine left on the skin when used in its sterilization, coming in contact with the omentum or intestines, will cause an injury to the endothelial layers of these organs and lead to the formation of adhesions. The careless use of sponges and packs may also lead to adhesions. It cannot be definitely stated just what caused the omental adhesions in the cases here presented, as in nearly every case there was some other intra-abdominal condition present producing symptoms. It can be readily seen that an adherent omentum can cause traction on the stomach and thereby produce a gastroptosis and a chain of gastrointestinal symptoms.

We are always confronted with the fact that in breaking up adhesions, either primary or secondary, there is always a tendency to their recurrence; this is especially true of omental adhesions. It is known that while omental adhesions are, as a rule, not especially firm, they have not the power to loosen themselves as have other structures. In twenty-five cases it will be seen that the omentum was adherent to structures within the abdominal cavity. Those to the uterus were at points where the adnexa, on one or both sides, had been removed and were evidently due to some raw or denuded surface, or to the irritation caused by sutures. Adhesions to the bowel (generally the cecum) were caused by trauma at a previous appendectomy; and adhesions to the small intestine were due to irritation at the primary operation.

In nine cases the small bowel was adherent to the parietal peritoneum, and in two cases the cecum was adherent to it. Here we are faced with the problem as to whether or not it is best to cover the intestine by the omentum before closing the abdomen, or to leave it high in the cavity. Personally I prefer omental to intestinal adhesions to the peritoneal scar. In one case in which a right inguinal hernia had been done, the patient complained of persistent pain at the site of operation and at McBurney's point. Upon opening the abdomen a chronic appendix was found, and the omentum was adherent to the inguinal canal.

In one case where multiple postoperative intestinal adhesions were found, a previous Gilliam operation had been done, and a very early tubal infection had been overlooked. An enterostomy was necessary to relieve the obstruction; and later, when this was repaired, it was found that the intestinal adhesions had entirely disappeared. In the two cases where the uterus was found adherent to the abdominal wall, one had had a ventrosuspension, and the other a Gilliam operation in which the round ligaments had been drawn too tightly.

In a number of cases of pelvic inflammatory disease I am sure that if the primary operation had been postponed until the more acute condition had subsided and the pelvic cellulitis had disappeared, it would, in all probability, not have been necessary to perform a second operation.

In the enumeration of these cases a combination of adhesions occurred in the majority of cases varying from simple peritoneal agglutinations to true adhesions made up of connective tissue with their own blood supply.

THE UTERUS

1. *Chronic Metritis:*—Under this subheading will be taken up those cases in which a chronic metritic uterus was left at the primary operation, and because of the symptoms produced by menorrhagia and metrorrhagia, it was necessary to remove it at a second operation. In some of these cases the symptoms produced by the metritic uterus did not appear until after the first operation, but in others the symptoms were present and the organ should have been removed at that time.

I do not advocate a hysterectomy in every case of adnexitis by any means, but think that every case should be a law to itself. The age of the patient, her social status, and the pathology present should all be considered. In operations for bilateral pyosalpinx and chronic salpingo-oophoritis the uterus is, almost invariably, removed in our clinics as a routine measure; and yet the men who follow this routine practice in their clinical work, hesitate to do the same when operating upon their private patients; of course the pathology is frequently more evident and further advanced in the lower classes than in patients of higher social standing.

One is often in a quandary when operating for complicated tubo-ovarian inflammation, just how far he should go in the operation; not that there would be any great danger in removing tubes, ovaries, and uterus, but as to the after-effects upon his patient as regards menstruation, ovulation, and pregnancy. It is only after we have permitted a diseased uterus to remain and the patient develops a persistent menorrhagia or metrorrhagia that we regret our conservatism.

Polak has advocated resection of the fundus uteri in order to preserve the menstrual function in cases of an inflammatory condition of the uterus. In a few cases this may be done with success, but in cases of large, soft, and boggy uteri, a hysterectomy is, in my opinion, the only operation that will give the satisfactory results. Some men have gone to the other extreme and advocated panhysterectomy, and many points may be brought out in its favor, as shown by M. Rochard (Bull. de l'Acad., Nov. 1918); but, in my experience, and in the cases here presented, this operation was not performed. In the face of an extensive pelvic inflammatory condition, where the operation is more or less tedious there is an added risk from hemorrhage, wounding the ureters, infection, and shock. To remove the cervix does away with a valuable support to the vaginal vault. It is claimed that the remaining cervical stump is a focus for infection and for this reason it should be removed. I cannot agree to this; though I have only seen two cases in which trouble followed the nonremoval of the cervix, and both of these cases were hysterectomies

for fibroids. They cleared up nicely after a few local applications of iodine to the canal. To do this rather radical procedure, in the face of an acute condition and where there is considerable pus, is, I think, exceedingly poor judgment.

There can be no advantage in leaving even an approximately normal uterus in a patient where it is necessary to remove both tubes and ovaries; but it is much better to leave the uterus, and even a small amount of ovarian tissue, if possible, and allow these women to menstruate, even if it is scant, until it terminates in amenorrhea. Thus the menopause will come on gradually and without serious disturbance.

The terms chronic metritis, metritic uterus, and uterine fibrosis are entirely too broad and not quite correct. It remained for Shaw, of England, and Otto Schwarz, of St. Louis, to give us the exact pathology of the conditions of the uterus in combination with inflammatory disease of the adnexa. They have called attention to the fact that a true chronic metritis and a hypertrophied uterus are not so common as we have been led to believe and that the condition more often presented is a chronic subinvolution. I have been extremely fortunate in having had the benefit of Dr. Schwarz's experience and material. If we study carefully some of the pathologic pictures under the microscope, we are at once impressed with the fact that these changes are permanent and that it is impossible for them to disappear; and that, when they are present and are producing their characteristic symptoms, the rational thing to do is to remove the uterus.

In one case a metritic uterus had been fixed to the abdominal wall, according to Ochsner's suggestion of a "temporary ventrosuspension" where a salpingo-oophorectomy had been done, in order to prevent the uterus from becoming retroflexed and adherent. Case 21 was evidently one of chronic subinvolution and without a doubt a hysterectomy should have been performed at the primary operation. Case 25 is in the same class, but even with a diseased condition present she became pregnant. Case 34 required three laparotomies before obtaining relief. In Case 31 an incomplete operation had been done the first time in the presence of an infected uterus and of the left tube and ovary.

2. *Uterine Fibromyoma.*—In this class there were 12 cases in which the condition just described was present either at the first or subsequent operations. The condition was often accompanied by other diseases of the adnexa, such as cystic degeneration of the ovaries and chronic salpingitis.

In Case 4 (a negress) a supravaginal hysterectomy had been performed, but the patient continued to complain of pelvic disturbances; and when the abdomen was opened four years later, numerous pelvic adhesions were discovered, the omentum was adherent to the old peritoneal scar, the cecum to the right broad ligament, several coils of small bowel were bound to the left broad ligament, an ovarian cyst on the left side,

and two small myomata between the cervical stump and the bladder, which had been overlooked at the first operation or had developed since then.

Case 17 had both breasts removed for bilateral adenofibromata; at the same time a bilateral ovariotomy for ovarian cysts was performed; the uterus was found to be normal, but within a year the patient began to have severe metrorrhagia, and examination revealed an interstitial uterine fibroid. The metrorrhagia gradually disappeared, but the uterine tumor continued to grow. Five years after the first operation she had a severe uterine hemorrhage. A hysterectomy was performed and a large myoma removed.

Case 18, in which a myomectomy had been done, was operated upon three months later and found to be the victim of an active tuberculous peritonitis. No data could be obtained that would indicate the presence of this condition at the first laparotomy. Case 53 had a previous myomectomy and was later operated upon for chronic recurrent appendicitis; here it was found that the omentum had become adherent to the suture line of the uterus. If greater care had been observed in covering over the uterine wound, and if the appendix had been removed at the same time, the patient would not have been obliged to submit to a second operation.

Case 95 brings up the question of myomectomy versus hysterectomy. In this instance a myomectomy had been done without relief, and upon removing the uterus fourteen months later, the uterine wall was found to be studded with numerous small myomata. It may be of interest to state that the catgut used in the myomectomy was still present in the uterine wall.

We see occasionally cases in which some of the older and now abandoned gynecologic operations have been performed. Case 27 is one of them. A retrodisplaced uterus had been fastened to the anterior abdominal wall, according to Howard Kelly, and because of the pain and dragging of the old scar, the menorrhagia and metrorrhagia, a secondary laparotomy became necessary. Upon opening the abdomen the uterus was found tightly fastened to the parietal peritoneum and upon its fundus a fibroid, the size of an orange, had developed. The patient died, supposedly, of postoperative ileus.

The too frequent curettement for uterine bleeding is well illustrated in a number of cases. For diagnostic purposes, no operation is better; but as a curative measure, the operation is seldom necessary. This is illustrated in Case 29 in which two curettements had been performed without relieving the bleeding, and not until a myomatous uterus was removed, did the patient obtain relief.

A vaginal myomectomy rarely benefits our patients, because of the involvement of the uterus. I have seen a number of cases in which this had been the method of treatment, and later a hysterectomy was neces-

sary to relieve the patient. In those cases where we have a pedunculated uterine polypus and not a submucous myoma, a hysterectomy is not indicated. The mistake is made because of the failure of a pathologic examination. Case 57 is one in which a vaginal myomectomy had been done.

Case 59 is one in which a gross error was committed at the first operation, which caused the patient three years of mental anguish. A partial resection of the cervix had been done and, without a microscopic examination, the patient was told she had a carcinoma. When seen three years later, a blood examination revealed a three plus Wassermann, and a laparotomy a large myomatous uterus with a bilateral pyosalpinx. The patient made an uneventful recovery and is perfectly well today.

In Case 92 an injury to a bowel resulted in fecal fistula. This is rather unusual in hysterectomies for fibroids; injuries to the bladder and ureters are more common. In Case 97 lack of judgment in the selection of the proper operation and failure to make a correct diagnosis is self-evident; an anterior colporrhaphy and perineorrhaphy was done in the face of a retroverted uterus which was beginning to undergo a descensus; the displacement being due to a fibroid on the posterior uterine wall. This led to a second operation.

3. *Carcinoma of the Uterus.*—While hardly in the province of this paper to bring up the subject of cancer of the uterus, I cannot help mentioning one case, No. 56, a patient age 56, in whom a vaginal hysterectomy was done for adenocarcinoma of the cervix. Seven years later she came under my care complaining of a bloody vaginal discharge, and upon examination a small metastatic nodule was observed in the upper angle of the left side. A laparotomy was performed; the bladder was dissected away from the vaginal scar and a portion of the vaginal vault was resected together with the nodule; the vaginal wound was closed. Five years have passed since the second operation, and there has been no evidence of a recurrence.

4. *Retrodisplacements of the Uterus.*—In this list are placed those cases in which the uterus was found retrodisplaced, either at the first or previous operations. The cases in which a retroverted metritic uterus was found, and removed, are not included in this table. The character of the operations performed to correct the displacement was as follows:

I.

A. Gilliam operation	17
B. Anterior plication of round ligaments	3
C. Webster-Baldy	4
D. Ventrofixation	2
E. Internal Alexander	1

II.

A. Bad results from first operation	10
B. Incomplete operation	6

I.

A. *Gilliam Operation.* As an operation of choice I much prefer the Gilliam operation, and especially with its modification by Crossen. There has been some adverse criticism as to its causing intestinal obstruction. I have not seen reports of more than five such cases. In about 150 Gilliam operations, which I have either assisted or operated myself, I have never observed this complication. If the distal end of the ligaments are drawn tightly against the parietal peritoneum, it is almost impossible for an ileus to occur. In a paper read before the Missouri State Medical Association in 1917, I reported a number of cases where excellent results have been obtained from this operation for sterility caused by retrodisplacement of the uterus. A great number of operations for retrodisplacements are done which are unnecessary; only those cases where the displacements produce symptoms, should be corrected. A subinvoluted retroverted uterus should not be operated upon until a pessary and other local treatments have been tried.

In Case 20 one of the round ligaments was not properly fastened and had broken loose. If this ligament had been "fanned" out over the fascia and sewed with interrupted sutures, this accident would never have occurred,

Case 24 illustrates the failing of trying to hold up a uterus that is low in the pelvis by fastening the round ligament on the anterior surface. The ligaments not only stretched, but the uterus underwent a descensus.

In Case 28 an incomplete operation had been done previously. A cystocele, with a uterus that has undergone a partial descensus, can only be corrected by either an anterior colporrhaphy and a Gilliam or a Watkins operation (three other cases were in this class).

In Case 64 the round ligaments had been drawn through the fascia too far and fastened, causing the uterine fundus to come in contact with the peritoneum. Two cases were in no way connected with a Gilliam operation; the fundus was abutting against the peritoneal wound and, therefore, became adherent. Two other cases had had previous laparotomies for pelvic conditions. An examination and the patient's history had failed to call attention to the existence of a retroverted uterus. Case 95 had a myomectomy and a Gilliam at the first operation, but more fibroids developed and a hysterectomy had to be performed 14 months later.

B. Anterior Plication of Round Ligament.—In four cases this operation was done. In the last three the results were bad; and, personally, I do not advocate this operation.

C. Webster-Baldy Operation.—In case 16 this operation had been done, but the condition found at the operation two years later could in no way be connected with the first operation. The cause of these

dense adhesions between the bowels and parietal peritoneum could not be associated with the operation. The adnexa were negative. Three other cases may be placed in this class. They were young unmarried women, and the results were good as far as the correction of the displacements was concerned.

D. Hysterectomy for Prolapsus.—In Case 83 an ill-chosen operation had been performed with the result that the patient developed a complete vaginal hernia. A perineorrhaphy and laparotomy, with the fixation of the cervical stump in the abdominal wall, gave excellent results.

E. Internal Alexander Operation.—In Case 68 this operation had produced a marked anteflexion of the uterus causing dystocia. A cesarean section had to be done to relieve her. Both mother and child lived.

F. Ventrofixation Operation.—Until recently there was considerable hesitancy about removing a uterus where inflammatory disease of the adnexa was present. Under "Chronic Metritis" are listed severe cases in which a large, soft, boggy uterus has been left and an attempt was made to hold it forward by one of the many round ligament operations. Ochsner, about ten years ago, advocated an operation which he called "temporary ventrofixation;" its object was to hold in place temporarily a retroverted and fixed uterus in the presence of adnexitis to avoid its dropping back and again becoming adherent. I plead guilty to having done this operation several times, but have recognized the error of it and abandoned the operation. I now have a case under observation in which I did this operation six years ago, and at the same time removed two large pus tubes. The patient has continuous pelvic pain and a marked retraction of the lower angle of the old scar, due to the pulling downward of the fastened uterus.

II.

A. Bad Results Following First Operation for Retroversion.—In Case 22, a Gilliam was done some time after examining the case; in the interval she contracted a gonorrhea, which was not observed at the time of the operation. The result was an acute pelvic peritonitis. In Case 72, a Gilliam was done in this patient who had a narrow pelvis and, when she become pregnant and went into labor, it was necessary to perform a cesarean section; but mother and child lived. Mention has already been made of the dystocia caused by an internal Alexander operation resulting in a cesarean. There are several other cases that come under this heading that have been taken up under the different operations for retrodisplacements of the uterus.

B. Incomplete Operation.—Only in Case 44 did the Gilliam operation fail to give relief. In this case a diseased coccyx caused the severe backache which was attributed to the retroversion.

III.

Retroversion with and without Fixation.—There are six cases in this class that were found at the second laparotomy. When a chronic metritis was present a hysterectomy was done. When the uterus was not diseased, the displacement was corrected by a Gilliam operation.

IV.

Postoperative Hernia.—Under this heading are listed 15 incisional hernias following laparotomies which were repaired secondarily.

A.1. McBurney incisions	5
2. Midline incisions	9
3. Umbilical	1
Postoperative hernia developed in the following wounds	
B.1. Clean wound	3
2. Infected wound	4
3. Drainage cases	6

A. 1. In one case an appendectomy, without drainage, was necessary; but shortly after the operation a fecal fistula developed. Evidently the appendix had not been tied off, nor the stump properly inverted and sewed over, and abscess developed at the cecum. The hernioplasty, performed eight months later, was successful.

Three cases were suppurative cases to begin with, and had badly infected wounds; another was a suppurative appendectomy that caused a secondary pelvic infection. The second operation was for a postoperative hernia at McBurney's point, and then a midline incision was made in order to deal with the pelvic condition.

A. 2. Of the nine midline incisional hernias, three followed clean laparotomies, three after inflammatory postoperative wounds, and two followed pelvic drainage cases. Of the clean cases one, Case 65, occurred after the third laparotomy; the second occurred in an unusually fat patient. The cause in the third case was undetermined. In Case 90, having an inflammatory postoperative wound, the hernia did not develop until the patient became pregnant and was delivered. Case 92 had a fecal fistula following a hysterectomy. A third developed soon after the infected wound had healed.

A. 3. One case of umbilical hernia recurred after labor; another operation proved successful and to date shows no evidence of weakening. Case 10 is of interest in that a right inguinal herniotomy had been done which failed to relieve the symptoms. A laparotomy revealed a chronic appendicitis and the omentum adherent within the interior ring.

Postoperative Fistulas and Sinuses.—Under this heading are seven cases; two postoperative discharging sinuses, and five fecal fistulæ. In both of these postoperative sinus cases the tract led to an infected adnexa that had not been removed at the previous operation of the fecal

fistulæ. One case developed after a simple appendectomy (mentioned under hernias). Case 22 was made to relieve an intestinal obstruction following a Gilliam operation. It was repaired with good results. Two cases followed hysterectomies, one for fibroid and the other for a chronic metritis. One case followed a partial hysterectomy for tuberculous infection. This case died.

In a discussion of fecal fistula following pelvic operations, it is strange that there are not more of these injuries considering the amount of this kind of surgery done by inexperienced men. Another fact to be considered is that a great majority of the fistulæ will close spontaneously. In the removal of tightly adherent pus tubes from the left side, the rectum is frequently implicated to such an extent as to result in fistulæ; but the cases I have seen have always healed of their own accord. A good rule to follow in the removal of pus tubes is to free and remove the right adnexa first, and thus have as clear a field as possible when attacking the left side and thus avoid injury to the rectum.

THE APPENDIX

Under this heading are included those cases in which the appendix was removed either for a primary diseased condition, as a routine, or a secondary operation.

(a) Appendectomy (primary operation) 35
(b) Secondary operation 13

In these two varieties of cases are those appendices that were removed either alone or in connection with some other operation. If they were removed previously they were diseased; or, if removed at the time of some other operative procedure, they were either diseased, or removed as a routine practice. The second class (b) are those removed at secondary laparotomies.

In 17 cases an appendectomy alone was done, and of this number five were suppurative. As this paper only deals with secondary operations, these cases were reoperated for various conditions. In one clean case, (already mentioned) a fecal fistula developed. Several cases had the appendix removed when some other pathology was the cause of the patient's symptoms. In eight cases of this number, an appendectomy was done when some right adnexal condition was responsible for the trouble. How often we see a small "gridiron" incision made, the appendix removed, and no exploration of the pelvis made! The neglect may even extend further, i. e., not even a vaginal examination is made.

In 22 cases the postoperative complications were found, either due to a previous appendectomy, or to an appendix that should have been removed at the first operation. Postoperative hernias are included. Case 9 was a clean case, but in consequence of the inexperience of the first operator, the appendix was not even found. At the second laparotomy

it was easily located and removed. In 9 cases the omentum was adherent to the scar, and in 6 other cases the small intestines were adherent to the old incision. In 6 cases the cecum showed marked adhesions at the site of the previous incision. In one case the cecum was adherent to the right broad ligament. Two cases were adherent to the right adnexa; and in two other cases adhesions were found between the cecum and the omentum; and in one case the adhesions were between the cecum and small bowel. The only explanation of this condition existing at the point where the appendix was removed is that raw surfaces were left at the previous operation. In two cases the appendix was found adherent to the right adnexa.

Under the subject of appendicitis in women, there are three striking points brought out by the above figures: (1) Postoperative hernia; (2) postoperative adhesions; (3) the neglect of the appendix at the first operation. The first condition can be corrected in most cases by stab wound drainage; the second by a more careful technic; and the third by an appendectomy in every woman in whom the abdomen is opened for some other condition.

VAGINAL OPERATIONS

A. Curettement.—There are several cases where a curettement was done in connection with other vaginal operations; but these will not be taken up as they are not worthy of note. There are 4 cases in which a curettement was done, not as a diagnostic, but as a curative measure. Cases 25 and 26 each had a curettement for a menorrhagia when the condition present, chronic metritis, required hysterectomy. Two cases had a curettage in the presence of fibroids. Two other cases had the same operation when the real condition was one of ruptured tubal gestation. Three of the cases had curettements for dysmenorrhea.

The diagnostic points in fibroid of the uterus are often difficult to determine, and it is only by exploring the cavity of the uterus that we are able to establish the diagnosis; but there is hardly an excuse for a curettement in the presence of a ruptured ectopic pregnancy. Personally, I see no place for a curettage in dysmenorrhea, sterility, or an incomplete abortion. Mosher, of Kansas City, has brought this latter point forcibly before the profession.

B. Perineorrhaphy and Trachelorrhaphy.—Perineorrhaphy: In this list are 15 operations for lacerations of the perineum of which 13 were primary and 2 secondary. Ten of these perineorrhaphies were done in connection with other pelvic work; three of them required reoperation due to failure of the first operation. Two cases should have had an anterior colporrhaphy at the time the perineorrhaphy was performed. Case 44 was done when the greater amount of trouble was due to an old fracture of the coccyx. One case had a retroverted uterus at the time the perineorrhaphy was made and should have been corrected then.

In Case 63 a hysterectomy for procidentia was done, and a badly lacerated perineum was left unrepaired. The result was a large vaginal hernia that necessitated a perineorrhaphy and a laparotomy in which the cervical stump was fastened in the old wall; the result was excellent. In Case 97 a myomatous and retroverted uterus was overlooked at the time the perineum was repaired, and this necessitated a second operation.

In a number of these cases poor judgment and a careless and indefinite diagnosis made it necessary for the women to be subjected to a second operation. This mistake is often made in the reverse way,—a retroverted uterus is corrected and a lacerated perineum with a cystocele is neglected.

Trachelorrhaphy.—This list includes 12 operations of which 11 were done primarily in connection with other operations; and one was done at the second sitting. In these cases very little or no improvement was obtained by the operation and, generally, some overlooked pelvic disease was the cause of most of the symptoms. A lacerated cervix very seldom gives rise to symptoms other than a leucorrhea; but we well know that if left unrepaired it may result in the development of malignant disease.

Curettements.—In this list are 12 operations; there were probably more, but they were not recorded. Two cases were for an incomplete septic abortion, three for a chronic endometritis, two for uterine hemorrhage in which a ruptured ectopic was later discovered, and two for menorrhagia in which a fibroid was present and the uterus removed subsequently. This operation, I think, will be employed less and less, except for diagnostic purposes.

Anterior Colporrhaphy.—There were five cases in which this was done; three as the first, and two as the second operation. In two cases a perineorrhaphy alone was done. A good result was obtained in Case 44, but a diseased coccyx was overlooked. In another case the operation gave good results, but an intraabdominal condition was neglected. In Case 97 this operation was improperly used; what should have been done was a Watkins operation.

In those cases where I have performed anterior colporrhaphy, I have always done some intraabdominal operation to hold up the uterus which is either retroverted or has undergone descensus or both. I have never had a recurrence. In women past the menopause the Watkins interposition operation has given excellent results in my hands.

OPERATIONS UPON THE ADNEXA

In this list are placed those cases in which a secondary laparotomy was necessary, due to conditions arising from the previous operation, or a new diseased condition, or an advancement of the disease originally present. It is not necessary to quote from the literature, except that excellent paper of Polak's on the "End Results of the Conserved Ovary," (Trans. Am. Gynec. Soc., 1918). I think one of the greatest questions

confronting the gynecologist refers to the best treatment for patients who are the victims of diseased ovaries and tubes. The pendulum has swung too far in both directions, the too radical operation of the past, and the too conservative treatment of later days. The question that nearly all patients ask before we operate is "Will it be necessary to remove my ovaries?" It is a great question, and we answer it by saying that we will only do that which is necessary to make her a well woman. We must learn by study and experience what the microscopic conditions of the tissues present are by their macroscopic appearance. Thus, much will depend upon our surgical judgment. How often do we see a case in which a bilateral salpingo-oophorectomy has been done and a badly diseased uterus left behind, or, if not diseased, to leave it retroflexed.

Reuben Peterson ("Preservation of the Ovaries, Entire or in Part, in Supravaginal or Panhysterectomy") claims that it is not necessarily true that younger women suffer more from a surgical menopause than older ones. This has been borne out in my own experience, neither does Bovee agree with this statement.

In gonorrhea of the tubes, a unilateral infection is seldom or never present, and to remove only one tube is to leave the operation incomplete.

Surgical technic is a beautiful feature; but when, where, and how to use it, can only come with training and experience. It is seldom that we see a wedge-shaped section removed from the uterine cornu when a salpingectomy is done, and the round and broad ligament fastened over this area; and yet how necessary it is that this be done, as there are small glands in this location which are, as a rule, infected and, if left, will later give rise to trouble. Little thought is given as to which is the first tube to be removed in a case of bilateral pyosalpinx; yet how much easier and safer it is to remove the right tube first and thus clear the field to avoid injury to the rectum. After one has torn the rectum several times, he learns to approach these structures with more respect.

The question of cystic degeneration of the ovaries is a hackneyed subject; yet it is one that up to this day has not been satisfactorily settled. In the past the ovaries were removed for dysmenorrhea, later resected; in both instances good and bad results were obtained. We now know that all dysmenorrhea cases are not due to cystic ovaries. The cirrhotic ovary is one that, in young women, gives rise to considerable trouble; and yet, when this condition is bilateral, we hesitate to remove both organs. In salpingectomy the circulation of the ovaries is frequently disturbed; later this may lead to cystic degeneration and necessitate another operation. The cases here reported, in which the ovaries have been resected, show rather poor results due either to the reformation of cysts, or to raw surfaces for the attachment and formation of adhesions. The small cysts in ovaries are nearly always multiple and, unless the greater portion of the ovary is resected, their removal had best not be

attempted. Davis and Curtis, of Chicago, (Chic. Gynec. Soc., Apr., 1916) have shown us that a large percentage of ovaries are infected when the tubes are involved, in 9 out of 11 cases; this also applies to ovaries in the presence of fibromyoma of the uterus and chronic appendicitis.

Removal of both ovaries at 1st operation	11
" " " " " 2nd "	13
" " " " " 1st "	26
" " one ovary " 1st "	18
" " both ovaries " 2nd "	13
Resection of ovaries at 1st operation followed by removal at 2nd operation	9
Resection of ovaries at 1st or 2nd operation	7
Ovarian cysts	5
Appendectomy, followed by second operation for diseased ovaries	11

The enumeration of the cases in which both ovaries were removed at the first operation does not include oophorectomies done in connection with a hysterectomy for a myomatous uterus. In Cases 11 and 21 a bilateral salpingo-oophorectomy was performed and the operation was incomplete at that. In the first case a retrodisplaced uterus was not replaced; and in the latter, a metritic uterus was left behind.

Two other points of interest are: nine cases that had primary resection of the ovary, necessitated an oophorectomy at a second operation; and that in eleven cases, in which a primary appendectomy was done, a diseased condition of the right ovary was found at the second operation; of the latter interesting point, I think, the relationship is too often overlooked and that the reverse is found; that is, a diseased condition of the right ovary and tube causing a secondary infection of the appendix.

TUBES

Removal of both tubes at first operation	19
" " " " " second "	4
" " one tube " first "	21
" " both tubes " second "	19
" " " " " "	8
" " one tube " " "	10

The striking point in the above figures is the fact that in 19 cases it was necessary to remove a remaining tube at a secondary operation. It certainly goes to show that there was too much conservatism at the first operation. As the majority of the tubes were infected by the gonococcus, the well-known fact is demonstrated that unilateral gonorrheal infection of the tube is very rare. I am quite sure that a number of salpingitis cases, either due to a distinct gonorrheal infection, or to a postabortal infection, were operated upon entirely too early; and that, if "watchful waiting" had been practiced, the results would have been better, and there would have been fewer postoperative complications.

Case 50 is rather a unique one and is worthy of mention. History: The patient was under my care for a bilateral salpingitis, receiving local treatments preparatory to an operation at a later date. One day she was taken suddenly with severe pain in her right side. When I arrived at her home, I found her in a state of profound shock. She was hurried to the hospital and a laparotomy was done immediately and revealed a ruptured right pyosalpinx with a left salpingitis intact. She made a nice recovery, but suffered an intestinal obstruction due to postoperative adhesions. Six months later a second laparotomy was performed to relieve her condition.

Two cases were instances of ruptured tubal gestation. They were overlooked in the preliminary curettement.

CONCLUSIONS

1. A more careful manipulation of all abdominal structures to minimize trauma, and thus prevent the formation of postoperative adhesions is essential.

2. A more careful study of the tissue before us when the abdomen is open, and the avoidance of too conservative measures when the pathology present demands radical measures.

3. The removal of every appendix in women when the abdomen has been opened.

4. That conservative measures are rather unsatisfactory when dealing with "cystic ovaries."

5. Conservative operative measures used in dealing with tubal infection should be abandoned.

NOTE: Through lack of space, only those cases cited in the text are listed below.

BRIEF CASE HISTORIES

CASE 3.—Age twenty-eight. First operation: Bilateral salpingectomy for salpingo-oophoritis with ventrofixation for a retroflexed and adherent uterus; appendectomy; resection of both ovaries. Postoperative history: Persistent pelvic and abdominal pain, menorrhagia; dysmenorrhea; profuse leucorrhea. Second operation, 4 months later: Findings, chronic metritic uterus and omentum tightly adherent to parietal peritoneum; cecum adherent to right horn of uterus; coil of small bowel adherent to left broad ligament; remains of both ovaries present and cystic. Hysterectomy, freeing of all adhesions, removal of all degenerated ovarian tissue.

CASE 4.—Age thirty. Supravaginal hysterectomy for fibroid uterus; appendectomy; left oophorectomy. Postoperative history: Pain for last two years in lower left quadrant. Second operation, 4 years later: Omentum adherent to scar; left ovary adherent to omentum, several coils of small bowel, and to the bladder; cecum adherent to right broad ligament; 2 small myomata in uterine stump. Operation: Freeing of all adhesions; removal of cyst and two myomata.

CASE 9.—Age twenty-two. Supposed appendectomy for chronic appendicitis. Postoperative history: No improvement. Second operation, 4 weeks later: Appendix removed; no adhesions or pus.

CASE 17.—Age forty-three. Adenofibroma of both breasts. Bilateral ovarian simple cysts. Operation: Removal of both breasts and ovarian cysts. Postoperative history: Occasional menorrhagia and metrorrhagia with pelvic pain; second curettement. Third operation, 7 years later: Findings, submucous and large interstitial uterine myoma; no evidence of either tubes or ovaries. Operation: Supravaginal hysterectomy.

CASE 18.—Age forty-six. Abdominal myomectomy for uterine myoma. Postoperative history: Persistent abdominal pain and abdominal distention. Second operation, three months later: Findings, tubercular intestinal peritonitis; uterus and adnexa, negative; multiple interior adhesions. Operation: Exploratory laparotomy. Recovery.

CASE 20.—Age twenty-two. Supposed Gilliam operation and appendectomy. Postoperative history: No improvement since first operation; persistent backache; dysmenorrhea; pain in pelvis; uterus found retroverted. Second operation, three months later: Findings, omentum adherent to old scar; uterus retroverted and low in pelvis; right round ligament adherent to parietal peritoneum; left one free; coil of ileum adherent to peritoneum at point where right round ligament was fastened to abdominal wall; left ovary cystic; left tube showed old inflammatory changes and was adherent to left broad ligament. Operation: All adhesions freed; left salpingo-oophorectomy; Gilliam operation completed; old skin scar resected.

CASE 21.—Age forty. Bilateral salpingo-oophorectomy for chronic postabortal inflammatory condition; appendectomy. Postoperative history: menorrhagia; persistent leucorrhea. Second operation, 5 months later: Findings, chronic metritis; uterus retroverted and fixed. Operation: Supravaginal hysterectomy.

CASE 22.—Age thirty-eight. Gilliam operation for retroversion. Postoperative history: General peritonitis and postoperative ileus. The operation was evidently done in the presence of an acute gonococcus salpingitis. Second operation, 3 weeks later: Findings, multiple intestinal adhesions with pelvic abscess; multiple intestinal obstruction. Operation: Enterostomy (artificial fecal fistula); drainage. Third operation, 6 months later: Findings, no evidence of any intestinal adhesions. Operation: Fecal fistula closed. Recovery.

CASE 24.—Age thirty. Anterior plication of round ligaments for retroversion and bilateral salpingectomy with partial resection of right ovary for cystic degeneration. Postoperative history: Dysmenorrhea; continuous backache. Second operation, 11 months later: Findings, omentum adherent to old scar; uterus retroverted and low in pelvis; sigmoid adherent to right broad ligament where tube had been removed; one coil of small bowel adherent to fundus of uterus; both ovaries cystic. Operation: Freeing of all omental and intestinal adhesions; removal of right and partial resection of left ovary; Gilliam operation. Postoperative history: Surgical menopause, relieved by corpus luteum extract.

CASE 25.—Age twenty-four. Chronic endometritis; lacerated perineum and cervix. Operation: Curettement; trachelorrhaphy and perineorrhaphy. Postoperative history: Pain in right side with dysmenorrhea. Second operation, 11 months later: Findings, retrocecal and adherent appendix; cystic left ovary; omentum adherent to old scar. Operation: Appendectomy; removal of left ovary; freeing of adhesions. Postoperative history: Continued pelvic pain; menorrhagia. Third operation, 2 years later: Findings, omentum adherent to old scar and to fundus of uterus; uterus enlarged and soft; chronic subinvolution. Operation: Supravaginal hysterectomy with removal of the tubes.

CASE 26.—Age twenty-seven. Operation: Curettement for menorrhagia. Postoperative history: No improvement. Second operation: Curettement. Postoperative history: No improvement. Third operation, 4 years later: Supravaginal

hysterectomy for chronic metritis, chronic endometritis, and chronic salpingo-oophoritis.

CASE 27.—Age forty-five. Ventrofixation for retroverted uterus. Postoperative history: Painful scar; menorrhagia and metrorrhagia. Second operation, 4 years later: Findings, omentum adherent to scar causing retraction of skin scar; uterus adherent to parietal peritoneum; fibroid on upper anterior uterine surface. Third operation: Supravaginal hysterectomy. Postoperative history: Died. Cause: Postoperative ileus (?).

CASE 28.—Age thirty-nine. Lacerated perineum with rectocele and cystocele. Operation: Perineorrhaphy. Postoperative history: Continued rectocele and cystocele. Second operation, 10 months later: Anterior colporrhaphy and Gilliam operation.

CASE 29.—Age forty-three. Two curettements for menorrhagia. No improvement. Third operation: Supravaginal hysterectomy for myomatous uterus.

CASE 31.—Supposed salpingo-oophorectomy for pyosalpinx; drainage. Postoperative history: Two discharging sinuses in skin wound; continuous pain in right side; frequent and painful urination; digestive disturbances. Second operation, 6 months later: Findings, omentum and several coils of small bowel adherent to old scar; bladder adherent to several coils of small bowel; appendix adherent to right broad ligament; uterus enlarged and soft; left salpingo-oophoritis. Operation: Freeing of all adhesions; supravaginal hysterectomy for chronic metritis; removal of left tube, ovary, and appendix.

CASE 34.—Age twenty-two. Right salpingo-oophorectomy for chronic gonococcus infection. Postoperative history: Pelvic pain; dysmenorrhea; leucorrhea. Second operation, 7 months later: Findings, left ovary cystic and adherent to a coil of small bowel. Operation: Freeing of adhesions and left oophorectomy. Postoperative history: Continued dysmenorrhea; menorrhagia. Third operation, 4 months later: Findings, chronic metritis; right chronic salpingitis; left broad ligament cyst. Operation: Supravaginal hysterectomy; right salpingectomy; removal of left broad ligament cyst.

CASE 44.—Age forty-two. Anterior colporrhaphy; perineorrhaphy; Gilliam operation and myomectomy (for subserous myoma). Postoperative history: Patient still complained of severe pain in back as before first operation. Second operation, 1 year later: Removal of distal end of coccyx for an old fracture of this bone. Postoperative history: Complete relief.

CASE 50.—Age forty-four. Spontaneous rupture of chronic pyosalpinx (right); left chronic salpingitis; right chronic oophoritis. First operation: Bilateral salpingectomy and right oophorectomy. Postoperative history: Acute intestinal obstruction due to postoperative adhesions six months after first operation; multiple intestinal adhesions. Second operation: Freeing constricting band of adhesions. Recovery.

CASE 53.—Age thirty-four. Trachelorrhaphy; Gilliam operation; myomectomy (subserous myoma); left oophorectomy (left cystic ovary). Postoperative history: Pain in right lower quadrant and over symphysis. Second operation, 2 years later: Findings, chronic appendix; adhesions of omentum to fundus and to old scar. Operation: Freeing of adhesions and appendectomy.

CASE 56.—Age fifty-six. Vaginal hysterectomy for adenocarcinoma of cervix. Postoperative history: Seven years later developed a metastatic nodule in upper left angle of vaginal scar. Second operation, 7 years later: Resection of vaginal vault. Five years have elapsed since second operation and no signs of recurrence.

CASE 57. First operation: Two myomata removed per vagina. Second operation, 7 years later: Large ovarian cyst removed (left side). Postoperative history: Pain and pressure in pelvis; bladder symptoms. Third operation: Findings, large ovarian cyst right side; intramural fibroid. Operation: Hysterectomy and right ovariotomy.

CASE 59.—Age thirty-one. First operation: Amputation for supposed carcinoma of cervix. Postoperative history: Continued uterine bleeding (patient had a 4-plus Wassermann). Second operation, 3 years later: Findings, interstitial uterine myoma and bilateral pyosalpinx. Operation: Panhysterectomy.

CASE 63.—Age eighteen. First operation: Appendectomy. Postoperative history: No improvement; constant pelvic pain; dysmenorrhea. Second operation, 3 months later: Findings, chronic bilateral salpingo-oophoritis (condition said to have been present before first operation); omental adhesions to old scar. Operation: Bilateral salpingo-oophorectomy; freeing of all postoperative adhesions.

CASE 64.—Age thirty-three. First operation: Gilliam for retroversion. Postoperative history: Dysmenorrhea and pelvic pain. Second operation, 6 months later: Findings, omentum adherent to old scar and to uterine fundus; uterine fundus adherent to anterior parietal peritoneum. Bilateral salpingo-oophoritis. Operation: Freeing of adhesions; bilateral salpingo-oophorectomy.

CASE 68.—Age thirty-three. First operation: Internal Alexander operation for retroversion. Postoperative history: Pregnancy; dystocia due to acute anteflexed uterus. Patient in labor 40 hours. Operation: Abdominal cesarean section (living child). Recovery.

CASE 72.—Age twenty-seven. Atresia of cervix; retroverted uterus; sterility. First operation: Dilatation of cervix; Gilliam operation; appendectomy. Postoperative history: Became pregnant four months after operation; in labor 32 hours; dystocia due to large fetus and small pelvis. Operation, 13 months later: cesarean section. Live child.

CASE 90.—Age twenty-nine. First operation: Right salpingo-oophorectomy. Postoperative history: Suppuration of abdominal wound; incisional hernia developed after pregnancy and delivery two years after first operation. Second operation, 3 years after first operation: Findings, postoperative ventral hernia; omentum adherent to hernial sac. Operation: Ventral herniotomy.

CASE 92.—Age forty-two. First operation: Supravaginal hysterectomy for fibroids. Postoperative history: Incisional hernia and fecal fistula; multiple adhesions. Second operation, 6 months later: Attempt to close fistula and hernia. Third operation, 1 year later: Closure of hernia and dissection of fistulous tract. Operation successful. Recovery.

CASE 95.—Age thirty-six. First operation: Myomectomy for subserous myoma; Gilliam operation for retroverted uterus. Postoperative history: Pain in lower abdomen; menorrhagia. Second operation, 14 months later: Findings, uterus adherent to parietal peritoneum; fundus and anterior surface studded with small myomata; cystic right ovary and chronic appendicitis. Operation: Supravaginal hysterectomy and appendectomy. Note: On section uterus was found to contain numerous subserous and interstitial fibroids; scars of old previous myomectomy were visible with shreds of 2 chromic catgut sutures present.

CASE 97.—Age thirty-three. First operation: Perineorrhaphy and anterior colporrhaphy. Postoperative history: Marked adhesions of uterus with retroversion. Second operation, 16 months later: Findings, retroverted uterus with myoma on post surface; bilateral salpingitis with right cystic ovary. Operation: Myomectomy; Gilliam operation; bilateral salpingectomy; resection of right ovary.

SOME INDICATIONS FOR HYSTERECTOMY

By J. F. Baldwin, M.D., F.A.C.S., Columbus, Ohio

As a general rule most surgeons limit their indications for hysterectomy to fibroids producing marked symptoms, to cancers, and rarely to certain types of puerperal infections; but occasionally they extend their advice to cases in which double tubo-ovarian abscesses have been removed, and in which the uterus is found denuded of its peritoneum.

A composite picture of a certain class of patients who present themselves very frequently to the physician, would represent a woman usually between 30 and 40 years of age, but with the limit extending in either direction; she has usually had one or more children, or miscarriages, or both; there often is a laceration of the cervix; the uterine body is enlarged, hard and tender, with more or less tendency to dropping down and retroversion; there is a history of prolonged and humiliating leucorrhea, pronounced dyspareunia, backache, bearing down, marked pelvic discomfort and general unhappiness. Almost invariably she has been treated locally by pessaries, tampons, curettements, Churchill's tincture of iodin, carbolic acid, Battey's iodized phenol, or something of that sort; during treatments she has perhaps felt a little better, but improvement, if anything more than imaginary, has been very transient.

Only a few months ago a patient was referred to me who had been studied in a celebrated Baltimore clinic for over two weeks. She had come home with the advice to keep quiet for a number of weeks, and to be dieted so as to reduce her weight by 15 pounds, as she was that much heavier than the average. (Her 15 pounds overweight was a family characteristic and therefore physiologic.) On obtaining her history I found that she had been wearing a pessary for over 12 years; she was menstruating every three weeks, the flow being about twice the normal and more or less clotted; there was a profuse leucorrhea, and pronounced dyspareunia, backache and bearing down pain. On examination I found a deep bilateral laceration of the cervix, the finger readily passing to the internal os; the uterus very tender, much enlarged, hard, and a little irregular in outline. Hysterectomy was advised and performed. The operation revealed a fibroid an inch in diameter at one horn of the uterus; extensive adhesions at that point, and the uterus itself weighed four times the normal. Her recovery was absolutely uneventful, and now there is no more leucorrhea, no dyspareunia, and she can go out riding with her husband without the slightest

discomfort, and is in every way in infinitely better health than she has been for many years.

I know of no treatment, local or constitutional, which will cure these cases of chronic uterine hyperplasia. If the condition is quite recent, hygienic treatment, hot douches, and possibly tampons may occasionally restore the parts to normal, but I am speaking here of chronic conditions.

Abdominal hysterectomy for the conditions mentioned is an operation which, when properly performed, is almost absolutely devoid of danger; while the relief afforded is prompt, complete, and permanent. Repeatedly, within a week of the operation, patients have told me that they had not felt so well for ten years, and I have no truer friends in my clientele than the many hundreds who have been subjected to this operation.

A number of years ago the late Maurice Richardson wrote an article in which he mentioned the dangers inherent to every operation, but having no direct connection with the operation itself. These dangers are present in every hysterectomy, but when the endometrium and vagina are sterilized, as in the technic which I described and clinically demonstrated at the meeting of the Association in Louisville, in 1916, the danger of peritonitis would seem to be eliminated, and that eliminates, humanly speaking, all the direct dangers of the operation. The occasional deaths which will take place from the causes mentioned by Dr. Richardson, will be vastly more than balanced by the improved health of the patients and the prolongation of life as the result of increased resistance to ordinary infections.

In saving the ovaries I feel that it is very important to save the tubes as well, unless they are badly diseased, since the nutrition of the ovary is so largely dependent upon the blood supply afforded by the tube.

At the completion of the operation the round ligaments and the stumps of the broad ligaments should be implanted in the vault of the vagina, and the ovaries attached to the round ligaments well up on each side so that they will not drop down into the culdesac where they might be a source of discomfort.

As the cervix in this class of cases is almost invariably unhealthy, and doubtless responsible for much of the leucorrhea, it should always be removed with the body of the uterus. Panhysterectomy I have been insisting upon for a number of years, partly to get rid of the unhealthy tissue and partly to obviate possible malignancy developing later.

Dr. W. J. Mayo recently (Jour. Am. Med. Assn., June 19, 1920) wrote quite at length of the importance of preserving the menstrual function. He even suggests that "menstruation itself has some important endocrine function," and says that "the effect on the patient is essentially the same whether menstruation is stopped by removing the ova-

ries and leaving the uterus, or removing the uterus and leaving the ovaries."

My own experience and observation has been so entirely different from this that I was surprised at the statement. Because of my having devised, a number of years ago, a method of operating for the construction of an artificial vagina, I have been consulted by a considerable number of women who had been born without a vagina; and, incidentally, in all those cases also without a uterus, although never without ovaries. Necessarily there had never been any menstruation, and yet in all those cases, except for the deformity, the women were apparently entirely normal and womanly, and many of them decidedly attractive. Twice I was consulted by young women having normal vaginas, but no uteri. They, too, seemed perfect women. We have all seen considerable numbers of women with absolutely infantile uteri, and yet they were normal except for the amenorrhea. I have done several thousand hysterectomies and the results have been so uniform that I had regarded it as a settled fact that the mere function of menstruation was entirely unimportant, and frequently a disadvantage and annoyance; but that the preservation of the ovary and its internal secretion, particularly in young women, was of very great importance to happiness and health. Hence, I have for many years removed the uterus without the slightest hesitation, except as its removal prevented child-bearing, while I have practiced conservation of the ovaries in women under forty, particularly under thirty-five, with the utmost care.

Why it is that the human female is the only one throughout the animal creation that menstruates, no one has been able to determine satisfactorily. Several hypotheses have been advanced. The statement has been made that the female of the monkey menstruates, but that has been authoritatively denied. While the menstrual function has a known average of time and amount, some women have such a scanty flow as to be practically none at all; and yet such women seem to be as healthy and fruitful as others. And it is well known that, occasionally, a perfectly healthy woman will have her pregnancies at such intervals that she has no flow whatever during her entire child-bearing life. It would seem self-evident that if the menstrual flow itself were of any particular importance it would extend throughout the animal kingdom, at least the higher types of animals, and its occasional absence in the human individual would be attended with marked and definite symptoms of ill health.

Since the publication of Dr. Mayo's paper I have taken pains at every opportunity to talk with patients upon whom this operation had been done a number of months or years previously, and their testimony has been uniformly contrary to his conclusions. My patients were all private patients, and my opportunities for ascertaining post-

operative conditions have been unusually good, so that I may state without fear of contradiction that postoperative discomforts, when normal ovaries are saved and with ample blood supply, except as due to other complications, are not present.

It occasionally happens that a surgeon is consulted by a woman who has suffered from dysmenorrhea throughout her entire menstrual life; if married, there have been no pregnancies, and the menstrual pain frequently precedes the flow by several hours or days. The menstrual discomfort and consequent disability may last for two or even three weeks out of every month. Examination will not infrequently show the presence of an undeveloped uterus, which has been the source of all of this discomfort, and which has been of no possible benefit. If the patient is young it is possible that the wearing of a cervical dilator for weeks or months, as advised by our late colleague Dr. Carstens, might produce such development of the uterus as would result in functional usefulness. I have tried that treatment in a number of instances; but thus far with uniform failure. However, its cautious trial might be wise so as to give the patient every chance. If, however, she is advanced in years no one would anticipate any improvement by that treatment; and in all those cases, if the pain is such as to demand relief, removal of the uterus should be made. In the comparatively young the ovaries should be saved because of their internal secretion; but the offending organ, the undeveloped and functionally imperfect uterus, should be extirpated.

The office of the surgeon is to save the life of the patient when it is in jeopardy; but more frequently it is to restore to health and happiness a chronic invalid. This paper is a plea for the cure of a class of chronic invalids who can be cured by the treatment suggested but who, too frequently, drift from one physician to another, to be treated by inert methods long since discredited by intelligent members of the profession.

CONCLUSIONS

(1) Chronic uterine hyperplasia is incurable by local or constitutional treatment, and its presence is the source of much ill health, discomfort, and unhappiness.

(2) Uterine hypoplasia is generally, if not always, a source of sterility, marked dysmenorrhea, and much invalidism.

(3) In these two conditions hysterectomy effects a cure, "*tuto, cito et jucunde,*" and should be resorted to when the diagnosis has once been established.

LUTEUM EXTRACT: A FURTHER REPORT

By Adam P. Leighton, Jr., M.D., Portland, Me.

FIVE years ago, I presented to this Association, a consideration of the use of corpus luteum extract in the treatment of the neuroses of the artificial and physiologic menopause, in dysmenorrhea, and for the relief of those symptoms usually coincident with, or following in the wake of lessened ovarian function. At that time I reported results obtained through the administration of this product, when specifically indicated and, in addition, had the temerity to incorporate in that paper, some personal theories to explain how the remedial action was brought about.

It is not my intention to delve deeply into the subject of general organotherapy or to attempt to explain in detail, physiologically, the probable reason for the beneficial results accompanying or produced by, the ingestion of luteum extract. The subject is too involved and contains so many diversified and contradictory opinions, that I confess, indeed, my inability to apply, to any great extent, the multiplicity of theories given in explanation of the supposed synergistic action and interrelationship of the several ductless glands.

In the past six years and a half, I have had the opportunity to employ ovarian organotherapy in the treatment of over three hundred women, each one of whom presented definite symptoms of diminished ovarian secretion, combined in some instances with lessened activity of other endocrine glands. They have all been private patients and, for that reason, I have been able to keep accurate case records and to observe in the majority the effect of thorough and prolonged treatment. I admit that the number of cases is small and that little importance may be attached to a report of this kind; however, my desire is but to state the result of my observation of these cases in which the only ovarian product used was luteum extract.

The importance of the endocrine glands in the physiologic economy has, in the past few years, been especially emphasized. Consistent with the advance of scientific knowledge of the subject, the greater and more widespread use of glandular substances in therapeutics has occurred. Laboratory experimentation has greatly aided in our understanding of certain glandular function, but for the most part our knowledge of the action of the ductless glands has come through clinical evidence and observation and, in regard to the corpus luteum, almost entirely.

The endocrine system is so finely balanced that a change in the in-

ternal secretion of one organ is capable of upsetting the entire equilibrium of the system. One, therefore, must consider the normal interrelation between a disturbed endocrine gland and the rest of such glands, before attempting to explain the symptomatology produced by the cessation or improper performance of function on the part of the individual organ of internal secretion.

The question as to what tissues in the ovary are responsible for the manufacture or elaboration of the internal secretion, still remains practically unsettled. In recent years, much discussion of this subject has taken place and, while it is admitted that the corpus luteum exercises an obvious internal secretory activity, there is good evidence that the interstitial cells of the ovary, have a function of distinct similarity.

Dr. Graves, of Harvard University, in his recent article on "Ovarian Residue" has endeavored to prove that an internal secretion equal or superior in therapeutic value to that produced by the corpus luteum, is manufactured in the general ovarian tissue. This investigator, claiming to have obtained irregular and unsatisfactory results from the administration of corpus luteum extract and a product from the whole ovary, resorted to the use of "ovarian residue" or that part of the ovary which remains after extirpation of the corpora lutea and which heretofore has been discarded as valueless. Dr. Graves has made use of ovarian residue in the treatment of those patients who exhibited the signs and symptoms of ovarian deficiency for which he had previously considered the other two products indicated and, after considerable experience with this new substance, he states that it is superior in its clinical results to any other ovarian preparation; that it preserves its chemical integrity longer and that, in truth, the secretion of the atretic follicles arising from cells analogous to the cells of the corpus luteum, is similar in action and more potent. I am unable to compare the respective merits of the two preparations, inasmuch as I have never used ovarian residue. Recently, I have had the opportunity to note ready response to luteum extract in the relief of menopause symptoms, in two patients to whom ovarian residue had been given by another physician, without benefit. It is fair to state, however, that I doubt if these two women had given the ovarian residue sufficient trial and that alone may explain the unsatisfactory results. It will be interesting to note the results obtained by other observers making use of this newer product, for while one does not doubt its efficacy, it is only through comparative results that we are able to arrive at the proper decision in regard to organotherapeutic treatment.

The correlation of the ductless glands, presents an intricate and interesting study. Certain truths we accept, but unfortunately most of our knowledge of endocrine function is theoretical and in endeavoring to differentiate between the physiologic phenomena supposedly

arising from this glandular activity in the normal state and the symptoms caused by abnormal functions, we meet with difficulty.

I have repeatedly observed, however, such a seemingly close association between the thyroid and the ovarian activity, that I cannot pass it by without due reference; because it has been demonstrated in my experience that, in the treatment of women presenting definite signs of ovarian deficiency, the use of thyroid extract is necessary in combination with luteum, to the end that the action of the latter is greatly enhanced, and more prompt, satisfactory, and lasting results are forthcoming.

I refer not only to those cases with undoubted thyroid insufficiency in which it is necessary to make use of thyroid extract, but in those instances where the etiologic factor of hypofunction is lacking and the condition is attributed to ovarian dysfunction entirely. Here I have given luteum extract thorough trial, without the usual benefit, and yet, where I add the thyroid extract in an empirical fashion, satisfactory results are often obtained.

While the correlationship of the adrenal, thyroid, pituitary and ovary is theoretically well known, it seems to me that the relative activity of the thyroid and that of the ovary is more suggestive, and probable.

It seems rational to believe that the thyroid exercises a particular governing effect upon the whole endocrine system, in truth, possibly presiding over and maintaining the synergistic action of the whole. No definite explanation has ever been offered for the hypertrophy and hyperplasia of the thyroid occurring during the menstrual period, pregnancy and in the early stages of ovarian deficiency, and yet it is obvious to all of us that an increase of thyroideal activity, to a greater or less degree, is evident at that time. It is a normal physiologic function, generally, but becomes decidedly abnormal when associated with primary hypofunction of the ovary or of any other gland of internal secretion.

May I be allowed to venture the proposition that, in cases of lessened ovarian function, this increased activity of the thyroid, manifesting symptoms of hyperthyroidism, many times is but a compensatory action of this organ, to supply the extra stimulus to the ovary, necessary for the maintenance of the phenomena presided over by the latter.

How often do we see this picture of slight ovarian insufficiency, coupled with thyroideal hyperfunction, and all the symptoms of the latter, followed soon after by the signs of thyroideal hypofunction; or, as I would call it, thyroideal decompensation. That this same picture may be noted when lessened activity of another gland occurs, and not the ovary, is likewise assumed, hence the idiopathic hyperthyroidism.

I have made use of thyroid in conjunction with luteum extract in the relief of some cases of menorrhagia, where uterine, adnexal, and

other pelvic disease, or tumor, might be ruled out. It has been as a matter of experiment, I will admit, but more often than not, exceptional benefit has followed.

The use of luteum extract uncombined in cases of premenopause menorrhagia, has brought about a marked diminution in flow and in the menorrhagia coexistent with ovarian cystic degeneration, mitigation of the hemorrhagic tendency is usual.

In my previous paper, mention of the fact was made that dysmenorrhea of a certain type was especially amenable to treatment through ovarian organotherapy. Others have reported excellent results. There is no doubt but that aside from the causes enumerated in text-books, ovarian dysfunction is a distinct etiologic factor. We do obtain results and therefore in explanation might we not assume that the ovarian hormone has a peculiar selective action in the uterus, in perhaps stimulating some endometrial autolytic enzyme, which so softens and digests the histologic elements of this tissue so that the normal physiologic phenomena (diapedesis, rupture of the hematomata, and exfoliation of the mucous membrane) are made possible and easy, thereby constituting normal menstruation. Where this ovarian hormone is altered or lessened, it may fail to stimulate in sufficient amount, this autolytic enzyme, with the result that the endometrium, lacking in its proper preparation and softening acts as a barrier to an easy escape of blood; the congested membrane either remains to form a foreign body and sets up uterine spasm or becomes detached in the comparatively large portions which are characteristic of so-called membranous dysmenorrhea. This is but a repetition of my former suggestion and, when I consider that the most favorable results were noticed in the administration of luteum extract, in those cases presenting the excessive first day pain, with scanty discharge simulating an intense unrelieved congestion, it is not altogether illogical.

Dysmenorrhea demands continuous use of luteum extract for a period of ten to twelve weeks, before one may expect to obtain relief, if such is to follow. To give luteum, or any ovarian product to a woman, with the directions to take it for the week or ten days previous to each menstruation, and to expect results, is a waste of time and money; and yet, I have often seen prescriptions calling for this inefficient therapy.

Hyperthyroidism and even early exophthalmic goiter has been distinctly aided by luteum. The extreme cardiovascular and general nervous manifestations have been lessened. Hoppe, of Cincinnati, has recently reported excellent results and bases his treatment on the theory that hyperthyroidism is caused by defective secretion of the interstitial sex glands and that the hormones of these have an inhibitory and regulating action on the secretion of the thyroid. When their function is deficient there is this lack of thyroideal inhibition with

the resulting excessive secretion of this organ or hyperthyroidism. Given primary ovarian insufficiency, or of any other ductless gland, I believe that this hyperthyroidism is the result of continuous and prolonged compensatory effort upon the part of the thyroid to make up the deficiency in action of that gland which first became underactive.

In the menopause in contradiction to the reports of others, relief of the distressing symptoms is especially possible. Luteum extract supplies that element so necessary to the woman during her normal menstrual life. This therapy exerts its greatest benefit in the treatment of those women who have begun to exhibit the early manifestations of the climacteric. To avoid the unsatisfactory results which have been reported by some gynecologists, it is necessary that luteum extract should be administered early and continuously once the diagnosis is made. Procrastination on the part of the patient or the physician often means ill success. When menstrual irregularity makes itself known and the hot flushes, mental confusion, tremor and hyperthyroideal symptoms are first evident, then is the proper time for ovarian organotherapy, not waiting until the height of the disorder has been reached or the woman has suffered for months or years with a "chronic" menopause. Early control is necessary and, once obtained, it is easy of maintenance. The action of luteum extract is slower, I have observed, and it takes longer to gain the effect of this product in the climacteric, than in any other condition depending on or due to ovarian deficiency.

In over half of those 300 or more women mentioned previously, to whom luteum extract was given, the indication for its use was solely the menopause symptoms. Of this entire number, there were not over a dozen who could not report exceptional benefit, even to absolute relief. The results gained seemed wholly in relation to the duration of the menopause and the length of time in which luteum was administered. Early menopause symptoms responded almost generally and completely. The longer the use of luteum extract had been put off, the poorer the results and the harder to gain control. Most of these women continued, or are continuing the treatment over a period of anywhere from three or four months to two years or more, obtaining relief all this time, or ultimately leaving off, when they have seemingly been helped through this trying epoch of their life.

The masterly paper of Dr. Sanes, of our own Association, on "The Hot Flushes of the Menopause," contains much of value and interest in the discussion of the etiology of this symptom.

Far be it from me to endeavor to utilize any part of his scientific presentation of the subject, but while you may accept the probable explanation, through the hyperactivity of the adrenal medulla, sympathetic system, thyroid, and posterior hypophysis, and conclude that the organotherapy of the menopause calls for the follicular structure

of the ovary, extract of adrenal cortex, and extract of the anterior pituitary, with the corpus luteum theoretically excluded, I can conscientiously and truly report the preceding satisfactory results with corpus luteum extract used alone. The prolonged and thorough use of luteum in the early physiologic and artificial menopause does relieve, and I am hoping today to hear others make a similar statement, to prove the truth of this remark.

To those women who during the menstrual life complain of so-called "sick headaches" of the frontal and temporal type, with nausea and vomiting, which occur with peculiar periodicity, at or about the time of menstruation, ovarian organotherapy offers much relief. At least that has been my experience.

In chlorosis, as an adjunct to hematinics, luteum is also indicated. I make it a point to prescribe it in each case, and in those instances where the moderate hyperthyroidism is present the action is especially beneficial.

The functional amenorrhea of women, in early adolescence or mid-menstrual life, responds in a miraculous manner as you all know. If obesity is a coexistent condition, thyroid is of inestimable value. No doubt pituitary dysfunction is to be considered in many of these patients; but, as yet, I have not made use of any pituitary product, relying wholly upon luteum or a combination of luteum and thyroid.

In obese patients where this deposition of fat is attributable to thyroid insufficiency, thyroid has long been used to remedy the abnormality. How often do we find that there are and have been symptoms of certain ovarian hypofunction also, and in fact, we are able to trace the origin of this type of obesity to primary ovarian lessened secretion, followed by thyroid decompensation, after the latter's attempt, for a while, to maintain a normal endocrine function.

In the use of thyroid as a "reduction cure" the giving of luteum at the same time seems to obviate the occurrence of profuse sweating spells, muscular weakness, tachycardia, nausea, and other vasomotor symptoms, occasionally following the ingestion of thyroid extract. Larger doses of thyroid are tolerated, if given in combination with luteum.

From these brief remarks, one might gather that I had found ovarian organotherapy one hundred per cent successful. Such is not the case; and, most assuredly shall I state, that in many cases where luteum was seemingly indicated, the results have been *nil*.

However, in those conditions where the administration of an ovarian product is called for, it has been my fortunate experience to observe a relief and cessation of many disorders, referable to deficient ovarian secretion, where proper diagnosis is followed by the continuous, thorough and regular use of luteum extract. It is important above all, that one should prescribe and the patient obtain a product from

recent fresh material and care must be taken to see to it that the dispensing chemists have such on hand. The indiscriminate buying of luteum extract is one thing which I am careful to prevent. A patient is directed to the shop where I know fresh tablets are to be had. Each prescription calling for such, bears on the directions label, "These must be taken for ten or twelve weeks" and special emphasis is laid upon this point. I explain every time, at the commencement of treatment, that it is cumulative in action, that it is nontoxic, when fresh, and that one must be conscientious in its taking, as results are obtained slowly and relief is not immediate.

DISCUSSION

DR. SAMUEL W. BANDLER, NEW YORK CITY.—Every paper which deals with the endocrines is a contribution whether it carries with it a theory or ideas contrary to a theory. If anything makes a man realize that the human body, as well as the human mind, is a complex organism, the treatment of which cannot be guided by any definite rule, it is the study of the endocrines. What will help one thing will not help another. There are certain rules we ought to follow and this paper mentioned something about the ovarian extract. I will be brief and simply state my own opinion with due deference to the experience of others. I use corpus luteum extract more frequently than ovarian extract or ovarian residue. Dr. Leighton uses corpus luteum with menorrhagic symptoms occurring at any time, especially at or preceding the menopause. The theory is that ovarian extract or ovarian residue stimulates menstruation, whereas corpus luteum extract inhibits or delays menstruation, and it acts as effectively as placenta extract does in making menstruation late. We know that the thyroid swells a few days before menstruation, and that it enlarges enormously and to the patient's benefit during pregnancy. The thyroid gland has a specific effect in menstruation, and in nidation of the ovum it has a specific effect in keeping the ovum where it should be and limiting the overcontraction of the uterus so as not to end in abortion. Most of the miscarriages occur at the menstrual period. The average woman tries to menstruate all during pregnancy, but is inhibited wholly by corpus luteum and placental extract and thyroid. All three hold the posterior pituitary, which acts when the woman is in labor, in check. If they do not hold the posterior pituitary in check, pregnancy goes on until the fourth or sixth month, and we call it a miscarriage. The corpus luteum stimulates thyroid activity before menstruation and still continues to stimulate it normally during pregnancy. If the thyroid is not stimulated during pregnancy, the toxemia of pregnancy, with involvement of the kidneys, comes about. I am almost prepared to state that a young woman with a very good thyroid never or rarely has a dangerous toxemia of pregnancy. So you have the thyroid and corpus luteum and placental extract acting in opposition to the pituitary. The time when corpus luteum would seem to be of the greatest benefit is in or about the menopause, because there, after all, you are dealing more with menstruation practically *in toto* by interrelation among the glands than at any other time. Even flushes and flashes at the menopause period are due more to overactivity of the posterior pituitary than to any other one thing, and since corpus luteum does oppose the posterior pituitary, it is the logical one to use. However, it will act in some cases where it will not act in others at all. In still other cases the whole ovarian extract or the placental extract, will not act. Absolutely nothing acts.

I saw for the first time a journal printed in German about two weeks ago in which a man reported the effect of the various endocrine glands on menstruation, and he tabulated 150 cases by one man who used corpus luteum for one purpose, and 150 cases in which another man used it for a totally different purpose, and both were eminently satisfied with their results.

DR. JAMES E. KING, BUFFALO, NEW YORK.—I think Dr. Leighton's contribution to this subject is a very valuable one because he has put it before us in a judicial and very sane way.

Dr. Bandler's closing remarks, it seems to me, cover the situation pretty well regarding the administration of these remedies, because I think our enthusiasm in any line of endeavor tinctures our opinion as to the results obtained. Personally I feel that in so far as ovarian extract or corpus luteum is concerned in therapeutics, they are very uncertain agents, so uncertain that I believe every time we administer these remedies we are doing it empirically and simply as an experiment. The only endocrine substance I have been able to give and have been able definitely to say beforehand I was going to get results, is thyroid extract to control bleeding in women approaching the menopause, in whom there are symptoms of a mild myxedema. In these cases only have I been able to feel I could say definitely I was going to get the result I expected.

In regard to corpus luteum and ovarian extract, I have never been able to say with any degree of certainty that I was going to get the results looked for, and that is the experience of Dr. Bandler who was really the first to emphasize the point. I think Dr. Leighton's work has contributed a great deal toward that end. Much of what we know about the endocrine system has come from therapeutic endeavors to correct the pathologic effect of the glands and a better knowledge of their physiology.

DR. GREER BAUGHMAN, RICHMOND, VIRGINIA.—One word in regard to the use of the corpus luteum in the vomiting of pregnancy. When Dr. Bandler said a thick necked woman is a safe pregnant risk, he has said a very important thing. Hypersecreting thyroid is one of the things I look for in a pregnant woman. If she has a thick neck I feel comfortable about her pregnancy so far as toxemia is concerned.

The only change I have made in the treatment of the vomiting of pregnancy has been the addition of corpus luteum to my plan, and since I have been using it, I have had only one case, who could vomit at will, that had to be aborted on account of vomiting of pregnancy.

Whether corpus luteum has done the work, or whether it has been my good luck, I do not know.

DR. ABRAHAM J. RONGY, NEW YORK CITY.—The only really good results that we see from the use of corpus luteum are in those cases which suffer from habitual abortion. I have had one woman who has been pregnant seven times and has never succeeded in carrying a child up to the point of viability. Others are those cases who give a history of abortion three or four or five times, and in whom everything else is eliminated. Those patients, if put on corpus luteum injections sufficiently early during pregnancy, have a chance of carrying the baby to the point of viability. I have had three such cases this year.

In regard to the use of corpus luteum in the early vomiting of pregnancy, I tested it out, and when the first report came out I was enthusiastic about it, and placed the patients in the hospital under proper surroundings, with proper care and proper nursing, and some of the cases responded very well, but only for a time. In a great many cases we did not get any results at all from the corpus

luteum extract. Whether Dr. Hirst uses a different preparation or not, I do not know. I am not very enthusiastic about the use of corpus luteum extract in the early vomiting of pregnancy, but it seems to produce marvelous results in cases of habitual abortion.

DR. JAMES E. SADLIER, POUGHKEEPSIE, NEW YORK.—Stimulated by Dr. Leighton's paper of five years ago read at the Indianapolis meeting of this Association, I proceeded to give corpus luteum a further trial in the peculiar phases of the climacteric. I must say that in quite an extended experience with organotherapy in that particular phase, I have had fully 75 per cent good results. In certain cases bordering on practical psychoses, I have seen splendid results, and I quite approve of what Dr. Leighton said with reference to the long-continued use of it. Its temporary or transient use does not seem to produce effects, but continued over weeks and months, I have obtained satisfactory results. I have had no experience in combining it with the thyroid extract.

DR. HERMAN LORBER, NEW YORK CITY (by invitation).—I wish to call the attention of the Association to a combination of ovarian extract or corpus luteum with other endocrines in cases of sterility. Dr. Bandler has reported 130 cases. Not many of us have had such an extensive experience as he has. However, a few of us who have tried ovarian extract in combination with other thyroid or pituitary depending on the individual case, have seen marvelous results in many cases of sterility where all other medical or surgical means have failed. In not a few the administration of only a few capsules of the drug has proved of value.

DR. LEIGHTON (closing).—While I will grant that the paper just read, is incomplete, I do get results, and I am not afraid to make that statement! I will admit that it is hard to explain physiologically in many of the cases why one obtains results, and I wish it were possible for me to make a true explanation.

To obtain satisfactory results, we must have a fresh product, a point which unfortunately is not sufficiently considered. People go around to drug stores and buy tablets which have been dried up or become damp. They cannot expect to have good results by using such a deteriorated product, and that is why they get toxic symptoms. The treatment must be prolonged. Many times men become discouraged if they do not notice results after short treatment. They have been told emphatically they must prolong its administration and yet they have often given up treatment at a time when they would see good results if they persisted. I have a great deal of faith in luteum extract in the early menopause symptoms and it is especially necessary to "get the patient under control." As I stated previously, the longer the neuroses of the climacteric have persisted, the more difficult it is to alleviate these distressing symptoms through the medium of this type of organotherapy. Regular, continuous ingestion of a fresh product of luteum extract is needed in any case where ovarian hypofunction is present, and in my experience, this substance must be taken for a couple of months, anyway, before satisfactory evidence of its action is shown, or its failure is assured.

CONGENITAL ABSENCE OF VAGINA AND UTERUS

By David Hadden, M.D., F.A.C.S., Oakland, Cal.

A YOUNG woman of 18 was referred to me by a psychiatrist to ascertain why no menstruation had occurred. The girl was fairly well developed for her age and presented no signs of nervous or mental deficiency. Her mother had consulted the psychiatrist fearing that the nonoccurrence of the periods might have a possible injurious mental effect especially in view of the fact that mental symptoms had developed in the father shortly before his death. In view of the physical findings it will be of interest to note that at no time in her life were there any symptoms that presented any periodicity. The girl is athletically inclined and is training as a physical instructor. All the external female body characteristics are true to type and the external genital organs perfectly normal except for a supposed imperforate hymen.

Rectal examination revealed an organ occupying the position of the uterus and not dissimilar in form though about one-third larger than normal. The anterior rectal septum seemed thick enough to warrant a diagnosis of a simple imperforate hymen, though there was no evidence of bulging from retained menstrual fluids.

An attempt made to dissect out the hymen showed that a complete absence of the vagina existed. Dissection carried up to the mass in the pelvis developed a condition that made it impossible to reach the supposed uterus without injury to the bladder or rectum.

As no consent had been given for an abdominal incision, I placed a Hodge pessary covered with rubber dam to keep the dissected area open until a decision could be reached.

A rather complicated problem resulted in view of the supposed presence of a uterus, with the perverted mental family history, as to the advisability of an attempt at vaginal construction. The conclusion of the patient and her mother favored a hysterectomy in case too great difficulty or risk arose in an attempt to construct a vaginal canal.

The abdominal incision revealed a complete absence of the uterus except what was represented by a slight thickening slightly toward the left of the median line on what was a well developed continuous round ligament extending from one ring to the other, though the loop was longer on the right side because of the presence of the body palpated through the rectum.

The round ligaments, tubes and ovaries were normal. Both ovaries showed recently ruptured graafian follicles. The body occupying the position of the uterus was retroperitoneal and thus explained the impossibility of being reached by the vaginal route. An opening through the peritoneum exposed a rounded kidney with a small notch posteriorly. The renal vessels were short and arose near the bifurcation of the aorta and the ureter was less than two inches in length. The kidney was therefore not a descended movable kidney but was originally formed low. Further investigation of the abdomen revealed the ileocecal portion of the bowel fixed in the right renal fossa and incapable of being drawn down or reached without excessive traction.

I resected the thickened portion of the round ligament that represented the undeveloped uterus in order to eliminate the possibility of abnormal changes de-

veloping later from some possible remnants of mucous membrane. Microscopically this tissue proved to be involuntary muscle but without uterine formation and no mucous membrane was found.

The construction of a vaginal canal from a loop of intestine was out of the question since the bowel loop would have been seriously interfered with through pressure on its blood supply and a transplantation of the kidney elsewhere was out of the question because of lack of motion and short attachments. In fact the relation was such that an intestinal loop would probably disturb the kidney blood supply.

If the kidney had proved to be a normally developed uterus an interesting conjecture would arise as to the advisability of attempting to construct a vaginal canal from a loop of bowel and the course to follow should pregnancy develop.

DISCUSSION

DR. JAMES F. BALDWIN, COLUMBUS, OHIO.—It is unfortunate that the mesentery was so short that the bowel could not be brought down in the usual way. In the original paper, in which I described the operation, I suggested that in case the mesentery should prove to be too short the sigmoid could be utilized instead. I have never found it necessary to so use the sigmoid, but one such case has been reported in the literature. I think one can always find enough sigmoid to use for this purpose.

If I remember correctly, I have done thirteen of these operations, and in all of them I have found the uterus to be entirely absent as in the case reported by the essayist. In one case for some reason the ovaries had been removed by a previous operator, but with all the others they were present and healthy. The tubes were also present, and in most of the cases a little bit of tissue like the end of the finger representing the uterus.

In my last case I found a curious malformation, in that there was no ascending, transverse, or descending colon. The ileum entered directly into a rather imperfectly developed sigmoid. In this case, however, I was able to utilize a piece of small bowel as in the routine method and she made an uneventful recovery. I have not been able to find on record any report of a similar malformation. Curiously enough there was a little tit-like process projecting from the sigmoid very much like an attempt at an appendix.

A case was reported a few years ago in New York City in which there was a normal uterus present, but this is the only report of the kind I have seen. In my original paper I suggested that when such was the case one loop of the bowel should be attached around the cervix and the uterus left. Menstruation would then take place normally, and I could see no reason why pregnancy might not ensue. Of course one can hardly imagine that the bowel could stretch like a vagina so as to secure a normal delivery, but delivery would have to be by cesarean section. The uterus was saved in this case.

PREVENTIVE GYNECOLOGY

By Henry S. Lott, M.D., Winston, N. C.

PREVENTIVE appendectomy, presented in a former paper, considered conditions originating in embryonic life, whereby formative membrane, failing in resorption, perpetuates throughout life's cycle, constricting, and immobilizing bands beyond the point of tolerance.

Gynecology means, not ablation, or distortion of organs, but conservation of the procreative function of womanhood. Function is the soul of human economy, giving to each organic structure the power of procreation and the spirit of perpetuation of its kind. Just as the glint of the morning sun gives life to mountain top and ocean, so function reflects the vital glow of the procreative organs. Preventive gynecology, therefore, may fairly deal with all causes, both intrinsic and extrinsic, which either shorten or block the vital currents essential to the physiologic performance of such function. Chief among intrinsic causes is infection; and infections may be classed under two heads, the ones that are inevitable, coming in the natural course of events in the period of girlhood, and the ones that may be avoided throughout all periods of life by prudence and cleanliness.

Chief among the first, and of much importance because they are inevitable, are the exanthemata, all of which, through the ravages of their inflammatory process, sear the pelvic cellular structures, and distort the delicate anatomic arrangement of the procreative organs. Thus the tubal fimbriæ, which should "float free" when the maiden stands erect —like the fish's fins in water, become agglutinated to the surface of the ovary, with the inevitable result of blocking normal circulatory currents, and abolishing function.

We know about it, but have we thought about this delicately beautiful, and highly sensitive mechanism: the floating fimbriæ, and its spasmodic clasp of the ovary, and how serious a matter this agglutination of structure, with lessening of the lumen of the tube will become in the life cycle of young womanhood, and how often the effort is made to correct this pathology, and relieve this pain, by removing the appendix; thus creating fruitful soil for reflex scar tissue instead.

And again, at the menstrual epoch, have we framed a mental picture of the ovary with its product just matured and rising to its surface, here to rest a little while in its clean transparent fluid, before rupture of the capsule, which permits it to be caught within the spasmodic clasp of the fimbriæ and started on its journey through the tube? The end of

this journey is the uterine cavity, and failing to meet its mate in the course of its travel, the ovarian product is swept away by the monthly storm via nature's drainage conduit, or, meeting its mate, before reaching the uterine cavity, an ectopic gestation is begun.

Knowing a thing, and realizing it, are quite different matters. We know that this anatomy exists in the female pelvis, and we have learned to recognize its gross pathology; but have we thought about it and come to realize that these structures are far more delicate, sensitive, and vital, because of their dual procreative function, than are any other organs in the human economy? And that mental, social, and atmospheric conditions, in this the maiden era of effulgence, are equally causative in the initial shock which disturbs currents and perverts function?

With marital relations established, assuring also the era of functional activity, the woman confronts again the dangers from infection and trauma, but chiefly of external origin. The neisserian infection, with an established pathology that is recognized and removed, is not the only one confronting woman through marital relations. If the affectionate, and aggressive husband, upon returning to the home, would take a bath first, the pelvic organs might be spared invasion by the mixed infection, from which agglutination of structure, with localized pus foci, and abolition of function, are far more fixed and fatal, than from the neisserian alone.

Obstetrics is surgery, demanding the same perfection of toilet and technic, and while trauma, at times, is unavoidable through disproportion between the maternal outlet and its passenger, *infection is not.*

The normal cycle of labor, beginning with conception, requires time and patience for safe completion. Ideal obstetrics means the conduct of labor to safe termination with no interference at all; and the man who has not the patience, and will not give the time to the woman for safe delivery, should not practice this branch of the service in which two lives are at stake, and in which many of the accidents are due either to ignorance or indifference on the part of the accoucheur. Forceps are life savers; but they are used too often, and we forget the menace they bear to the maternal soft parts and the fetal head. Extensive tears, with destruction to the cervix, posterior vaginal wall, and sometimes the sphincter as well, while distressing, and often unnecessary, are recognized, and an effort is made at repair; but please remember that the trifling ones, just a break in the mucous membrane, perhaps, offer avenues to infection, just as sure and just as inviting for invasion of pelvic cellular structures, with all of its distorting results. The severe cases, with rigors and sweats, covering a critical period of weeks, and ending either in a fatality or a pus focus, are so evident in their origin that "he who runs may read"; but the mild infections, with just a slight rigor within the first week, with a longer period of convalescence, and failure to furnish milk, the most marked clinical features, are insidious, and fatal to function, and fatal to physical comfort afterward.

In these mild postpartum infections, the pathology is much like that of the exanthemata; invasion, with slight effusion into the pelvic cellular tissues, congestion of the fallopian tubes, with complete or partial occlusion of the lumen, and agglutination of its fimbriæ to the surface of the ovary. Thus function is abolished, and sterility established that cannot be accounted for because of normal marital relations.

Postpuerperal sterility, its cause and surgical treatment, presented in a former paper, describes more fully this pathology; picturing its clinical history, with abolition of function; and also suggests a surgical procedure by which the patency of the tube is restored, and the fimbriæ freed from the surface of the ovary.

Recognition, and mechanical repair of injuries to cervix, posterior vaginal wall and perineal structure, concern the obstetrician very closely. Plastic surgery today, is not given the prominence to which it is entitled. For this there are two reasons—first, it is less attractive, demanding much time, care and precision in toilet, technic, and material, if ideal results are obtained; second, *it tells on us!* Much clumsy, and unnecessary work may be done through an abdominal incision, and the patient remains in blissful ignorance of the fact; but a distressing cystocele, a lax posterior wall, or a torn sphincter, breaking down the first time the woman goes shopping, is a living and lasting monument to the man who assumed the responsibility of its repair.

The subinvoluted postpartum uterus occurs more often than we realize, and its baneful effects are assured. Let us remember the importance of the uterus, and especially in this the era of functional activity. For four reasons it should not be removed; two of these reasons are anatomic, or mechanical; and two are physiologic, or functional. The uterus is the keystone to the arch of the soft structures of the pelvis and the living-room in the procreative center; and, most important of all, it is *the organ of menstruation and nature's drainage conduit.*

May I tell you something, illustrating the attitude of the people, and emphasizing the importance and responsibility of our service? One morning, just seated in my office, a gentleman entered with his wife, a young woman of fine physique, having arrived from an adjoining county on an early train. The husband approached me and said: "Well, Doctor, we have decided to have our womb taken out." "Certainly!" was my reply. "Be seated, and we will take it out while you wait." * * * In a nearby town they found the service they demanded, and the husband is now a festive widower.

The uterus is the most intelligent organ in the economy, if given a chance; and the subinvoluted, postpartum uterus, if bled freely from its endometrium, and the woman kept quiet for a while, will return to normal size and tone, preserving throughout the era of functional activity, the integrity of the pelvic cellular arch, and the organ of menstruation, its most essential function, nature's drainage conduit.

Retrogression of vital currents, with atrophic changes, subsequent to this era, completes the life cycle of womanhood. Such changes, with abolition of function, are in nature's plan, and, being inevitable, we may depend upon them. *As the come and go of circulatory currents throughout the eras of effulgence and functional life, under control of cerebral centers, establish and perpetuate functional activity, with its periods of rest, so the cycle is closed by the recessional wave, with atrophy of organic structure, when its terminal duty is done.*

Gynecology means safety and comfort throughout this the final era of woman's life; and with the recognition of these facts, and the adoption of these principles involved concerning trauma and infection, with present day toilet and technic, obstetrics will become preventive gynecology; and the gynecologist, the man with high ideals of altruistic mould, will be upon an established plane of distinctive service.

"When the great Ship of Life Surviving, though shatter'd, the tumult and strife of earth's angry element—drives safe into port," and the "last Bill of Health," is demanded, its reading will show:

"How fared the ship through the trials she pass'd?
And—What is the state of the ship at the last?"

THE FEMALE PELVIC URETER

By David W. Tovey, M.D., New York, N. Y.

PALPATION of the pelvic ureter should be a part of every vaginal examination. There is nothing between the fingers and the ureters except the vaginal wall. They can be felt from the bladder to the pelvic brim. It is easy to teach students to palpate the ureters, after they have learned their position, by inserting ureteral catheters. The ureters are one inch apart in the trigone, about one inch behind the internal urethral opening, and two inches behind the external meatus. They are about two inches apart at their entrance into the bladder, where they run through the bladder wall for three-quarters of an inch. These points are about half an inch in front of the cervix on the anterior vaginal wall, and about an inch from the crossing of the ureter by the uterine artery.

After leaving the bladder the ureters curve over the anterior vaginal wall and lateral fornix, to a point half way between the lateral border of the cervix and the pelvic wall, where they are crossed by the uterine artery on a level with the internal os about an inch from the lateral border of the cervix and two inches from the ureteral openings. From the point of crossing, the uterine artery accompanies the ureter for one or two inches through the base of the broad ligament to a point on the pelvic wall just above the spine of the ischium, where it turns upward on the pelvic wall covered by peritoneum, sometimes in front and sometimes behind the internal iliac to the pelvic brim. The ureter leaves the pelvis through the infundibulopelvic ligament behind the ovarian artery. The right ureter is more often in front of the division of the common iliac, the left one behind it.

The ureters are often outlined on the anterior wall by the ureteral ridges. In 1880 Pawlick catheterized the ureters by using the ridges as landmarks.

The following directions will aid in palpating the ureter from the bladder to the base of the broad ligament. Imagine a line from a point, about half an inch in front of the cervix, to a point half-way between the lateral border of the cervix and the lateral pelvic wall. The point half an inch in front of the cervix where the ureter enters the bladder, varies with the position of the cervix. The point half-way between the lateral border of the cervix and the lateral pelvic wall, is where the uterine artery crosses the cervix and is fixed.

The vaginal fingers are introduced into the anterior lateral vault of the vagina. Counterpressure is made downward through the abdom-

inal wall. Draw the fingers forward. As the tissues slip through the fingers, the ureter is palpated as a flattened cord-like body, smaller than a goose quill, displaced in its bed of loose cellular tissue, as it slips through the fingers.

It can be rolled from side to side under the palpating fingers, by moving the fingers toward the bladder, or toward the broad ligament. The ureter is felt from the bladder to the base of the broad ligament.

Posterior to the broad ligament it is felt just above the spine of the ischium, covered by the peritoneum, to the pelvic brim, by palpating it against the pelvic wall. It may run as high as an inch above the ischial spine. Judd advises sweeping the fingers above its location, bending the fingers as in picking a guitar. In the latter part of pregnancy the ureters do not follow the pelvic wall to the spines of the ischium, but after accompanying the internal iliac artery they pass beneath the broad ligament just below the pelvic brim.

In examining the ureter per rectum, insert the finger to the bifurcation of the iliac artery, which is located and traced downward, with the tip of the finger. Palpating behind at the side and in front of the artery, the ureter can be followed in its course until it passes under the broad ligament.

The normal ureter is never painful. If diseased, it is enlarged from the size of a goose quill to that of a lead pencil or larger. Tender pressure brings an intense desire to urinate, compared with its fellow, which is rarely as much enlarged unless both are diseased as in the pyelitis of pregnancy. The tuberculous ureter feels like a string of beans. Calculi, gravel, pyelitis, tuberculous kidney, gonorrhea, cervicitis, lacerations and infections from the cervix, cause ureteritis, periureteritis and stricture. Because of the nerve plexus of the abdominal sympathetic, pain is diffuse and symptoms are caused in the adjacent abdominal viscera, bladder, uterus, ovary, appendix, stomach, gall bladder, etc.

Bladder symptoms following hysterectomy, in which the cystoscope shows a normal bladder, are due to ureteritis and not to cystitis. Sänger, 1886, reported cases of ureteritis treated for long periods for cystitis. Judd reports a case of early pregnancy with ureteritis and spotting, mistaken for ectopic pregnancy. Hunner has reported a large number of strictures of the lower ureter, mistaken for all sorts of abdominal conditions. The Mayos report that most of the cases of kidney and ureteral stone coming to them, have been mistaken for other abdominal conditions and have had operations on stomach, gall bladder, ovary or appendix. Kelly and Burnham state that gonorrhea is a common cause of ureteritis and stricture.

Chronic pyelitis and ureteritis cause stricture of the ureter, and are followed by hydronephrosis if not promptly and properly treated.

Ureteritis, due to lacerations and infections of the cervix, if treated early, will not result in stricture.

CASES TREATED FOR VARYING ABDOMINAL CONDITIONS MADE CLEAR BY PALPATION OF THE PELVIC URETER

CASE 1.—R. J., thirty-five years. Since birth of child, five years ago, pain in left side of abdomen and back, very severe at times. Frequent painful urination. Was advised to have ovary removed and was treated for constipation, cystitis, ulcer of stomach, etc. Examination: Pelvic organs normal; cervix lacerated, eroded and infected; left ureter enlarged and very tender; palpation creates intense desire to urinate. Collargol injection showed ureter slightly dilated just over the bladder; kidney pelvis slightly dilated. Pain relieved after ureteral catheterization.

CASE 2.—A. G., sixty years. Patient sent to New York Polyclinic by Dr. Wells. Acute pain over gall bladder; right abdomen tender and rigid; half a grain of morphia gave only partial relief. Examination: Right ureter enlarged, tender and very sensitive; small stone felt just above bladder. Right ureteral meatus, red and swollen; catheter obstructed 2 cm. above bladder. Collargol injection showed small stone in pelvic ureter with ureter dilated above it. Kidney pelvis moderately dilated. Patient relieved immedately after examination. Four days later she passed a stone the size of shoe button.

CASE 3.—G., thirty years. Single. Pain in right abdomen; indigestion. Sent to have appendix removed. Examination: Pelvic organs normal. Right ureter thickened, tender, pressure creates desire to urinate. Collargol injection showed stricture just above bladder; ureter dilated above it; small hydronephrosis. Cured by dilatation of ureter.

CASE 4.—R. S., twenty-two years. Married four years; one child three years old; three miscarriages brought on by midwife; operation two years ago for gallstones; a year later operation for adhesions of gall bladder; complains of pain in right abdomen; backache worse on walking; frequent urination; profuse leucorrhea. Examination: Right ureter enlarged and tender; palpation creates desire to pass urine; cervix eroded and infected. Collargol injection. Ureter slightly dilated above bladder. Treatment to cervix and vault of vagina brought relief.

CASE 5.—Patient thirty-two years old; one child aged five; last menses three months ago; severe pain in right ovarian region, accompanied by spotting. Sent to Polyclinic Hospital to be operated upon for ectopic gestation. Examination: Pregnant three months; right ureter enlarged, very tender; pressure creates desire to pass urine. Treatment to vault of vagina; urotropin, and lavage of kidney pelvis brought relief.

CASE 6.—K., forty years. Fever; chills; tumor in right abdomen, diagnosticated to be gall bladder and ovarian cyst by different men. Frequent urination; blood clots in urine, at times, which were accounted for, by the physicians, as result of inflamed urethral meatus. Examination: Right ureter much enlarged and tender; bladder normal; right ureteral meatus reddened and contracted. Collargol injection. Soft stone in kidney pelvis, size of plum, which did not show in x-ray. Large pus kidney with very soft stone removed.

CASE 7.—I. R., twenty-five years. Married three years; pain right side of abdomen made worse by walking; indigestion; constipation; appendix removed without relief. Was advised to have ovary removed. Examination: Right ureter enlarged, very tender on palpation, which creates intense desire to pass urine; small hard mass,

believed to be a stone, felt at entrance of ureter into bladder. Cystoscope showed small reddish brown stone sticking out of ureteral meatus. X-ray showed stone half inch long at entrance to bladder. A few days later the x-ray examination showed stone two inches higher up in ureter. At first examination it was impossible to dislodge stone. Ureter dilated and stone passed.

CASE 8.—M. K., thirty-seven years. Operated on, two years ago, for left tubo-ovarian abscess. For past year pain in left kidney and abdomen; frequent urination, every half hour at night; pain very severe of late. Examination: Uterus slightly fixed; left ureter thickened and tender; palpation brings on intense desire to urinate left kidney region painful; cystoscope shows left meatus contracted and retracted; catheter obstructed 6 cm. from bladder; ureteral meatus contracts, but no urine passes. Operation: A small hydronephrotic kidney removed; lined by thickened membrane.

CASE 9.—J. M., thirty-five years. Since birth of last child, three years ago, indigestion, pain over right kidney, and over right abdomen; urination frequent and painful, at times. Has been treated for cystitis and was advised to have appendix removed. Pain in ovarian region during menstruation. Examination: Pelvis normal; right ureter enlarged, tender, and palpation creates intense desire to urinate; cervix lacerated, eroded and infected; cystoscope reveals normal bladder. Collargol injection shows ureter dilated 3 inches above bladder. Treatment to cervix and vault of vagina gave relief.

PATHOLOGIC LEUCORRHEA AND ITS TREATMENT

By Francis Reder, M.D., St. Louis, Mo.

IT IS somewhat unfortunate that the vulva presents an anatomical conformation which makes it not only difficult to cleanse, but also to maintain a proper state of cleanliness. Many of the discharges caused by inflammatory conditions of the genital mucous surfaces in children and in young girls are due entirely to a want of cleanliness, to a collection of the natural secretion in the parts and its subsequent decomposition.

A discharge escaping from the female genital fissure, if not hemorrhagic, can be conveniently termed a leucorrhea. This appellation is the customary one so long as the character of the discharge, and the various states upon which the discharge depends, have not been determined. When the true source has been revealed it becomes incumbent upon us to speak of the lesion causing the discharge, rather than calling the condition "a leucorrhea."

The term leucorrhea groups together a large number of disorders of the uterovaginal canal which, in a symptomatic manner, give definite expression to the character of the lesion and its possible anatomic location.

A leucorrhea, however, must not be interpreted too liberally as being the symptom of some morbid condition of the female genital tract, for there are other conditions, the very opposite to inflammatory lesions, which may be responsible for a leucorrheal discharge. In connection with such leucorrheas, it may be said that the principal disorders of menstruation, including amenorrhea, dysmenorrhea, menorrhagia, vicarious menstruation, and the catamenial climacteric, all have important relations to vaginal discharges.

A leucorrhea of an annoying nature, not dependent upon any morbid state, may precede and succeed a normal menstrual function in a healthy young woman. It may establish itself during the earlier period of married life, or it may become apparent during the pregnant state, and also during the period of lactation. These leucorrheal discharges manifest themselves in healthy women irrespective of age.

In children and infants in particular, leucorrheas are not infrequent. They consist almost entirely of a discharge from the glands of the vulva, these parts being more developed in a child than the rest of the sexual organs. In these instances constipation, ascarides, and neglect of cleanliness are the most common causes.

During the period of dentition a mucous or mucopurulent secretion

may not infrequently show itself; and it is not unusual to find children suffering from an eruptive disease presenting a leucorrhea. Although such a discharge may become intractable, it cannot be classed as chronic. Its tendency is to be intermittent, and as long as the bacterial contamination is kept in abeyance by the protective microorganisms of the vaginal canal, such a discharge must be looked upon as a physiologic reaction. The treatment is simple and seldom requires anything more than the rigid enforcement of hygienic measures.

Neither can a leucorrhea, allied with constitutional tendencies to ill health, be considered in the light of a pathologic discharge. It is rather the type of a subgroup of a physiologic hypersecretion, expressive of the constitutional disorder itself. Usually with the cure or the amelioration of the constitutional disorder, the discharge will improve and often disappear.

An excessive excretion from the hypertrophied uterine mucosa, caused by the presence of a fibroid tumor or a polypoid growth, will be designated as a leucorrhea as long as its origin remains obscure. These discharges are the expression of a morbid physiology and cannot be justly classed as pathologic.

It will always remain a somewhat difficult undertaking to properly classify leucorrhea. A physiologic leucorrhea may retain its characteristics as long as the vaginal defenses are sufficiently strong to cope with an extraneous microbic invasion. The resisting power of these structural defenses has its limitations and unless aid is rendered before they are exhausted, the condition must eventually drift into a chronic state.

Can this chronic state be looked upon as pathologic? The answer must be in the affirmative, inasmuch as it has been demonstrated microscopically that marked structural changes have been excited in the tissues of the uterovaginal tract which have caused the innocent character of the discharge to assume the characteristics of the contaminating bacteria.

A leucorrhea of this type, when of recent origin, is either of the exaggerated mucous variety, consisting chiefly of mucous corpuscles and plasma, secreted chiefly in the follicular canal of the cervix, or it is of the epithelial variety, in which the discharge is secreted by the vaginal portion of the os and cervix and is freely mixed with scaly epithelium and its debris. These two varieties may, of course, exist in various degrees of combination; sometimes the one and sometimes the other preponderates, or is the original affection, but the chief importance must be given to cervical or mucous leucorrhea as being the most obstinate and common.

In the severe cases these discharges are bacterially contaminated and become mucopurulent in character. The irritative action of the

discharge leads to pathologic changes in the vaginal walls and cervix, thereby increasing the severity of the symptoms and the difficulty of cure.

The most frequent structural changes observed in the vaginal type of leucorrhea are those of desquamation. The villi become affected and not only is epithelium separated with extraordinary rapidity, but pus is formed upon the irritable subepithelial or villous surface. Occasionally epithelium is thrown off in large shreds, in which the pavement-like arrangement of the scales is perfectly preserved.

In cervical leucorrhea the pathologic changes occurring in the os uteri, the external portion of the cervix uteri and the lower portion of the cervical canal are, usually, more pronounced than those of the vaginal canal, presumably because the structures are more inviting for the propagation of the bacterial flora. The lining of the cervical canal is a true mucous membrane. It is covered in great part by cylinder epithelium and abounds in immense numbers of mucous follicles having a special arrangement. It excretes a true mucous secretion, alkaline in character, consisting of mucus corpuscles and plasma mixed with little or no epithelium. Note, if you please, the difference from the lining membrane of the vagina which approaches in organization the skin. This membrane is covered by a thick layer of scaly epithelium, containing in the greater part of its surface few, if any, mucous follicles or glands; its secretion is acid, consisting chiefly of plasma mixed with epithelium.

Frequently diseased conditions of the lower segment of the uterus are secondary affections the result of a leucorrhea. Under such conditions the os and cervix uteri may present a vascular injection, an epithelial abrasion, a superficial ulceration, or an induration and hypertrophy with erosions. It is not uncommon to find associated with these lesions, abrasions and superficial ulcerations of the upper portion of the vagina. A type of chronic leucorrhea having its origin in cervical affections in which the leucorrhea is considered a subordinate symptom, is birth laceration.

A bruised, ecchymotic and lacerated cervix furnishes a most inviting and fertile field for microbic activity. Although the condition may exist for a long time without attracting attention, secondary pathologic changes such as erosions, granular inflammation of the cervix, cystic degeneration, extensive hyperplasia with ectopic lips, will sooner or later give evidence by a profuse and persistent mucopurulent or purulent discharge that a lesion exists.

A type of leucorrhea which has received well deserved attention on account of its chronicity and its great obstinacy to treatment is the gonorrheal type. This infection conforming to the different intensity of the poison, the susceptibility of the patient and the neglect or care with which the affection has been treated, can be far reaching and very

disastrous in its virulent action. It is a true pathologic leucorrhea. Although the vagina most commonly harbors a gonorrheal infection, the gonococcus from physiologic causes may readily be carried to the lower extremity of the uterus and there find vastly more suitable quarters for dwelling and propagating. Particularly is this true where catarrhal conditions of the mucous membrane or old birth traumas of the cervix have rendered these structures more susceptible to specific inoculation.

The vagina possesses a normal secretion contributed by a great variety of saprophytic microbes, both bacilli and cocci. The properties of these bacteria are capable, to a certain extent, of materially modifying the virulency of the gonorrheal poison and eventually cause the coccus to disappear from its folds. In the secretion from the mucous membrane of the cervix these fortunate properties are lacking. Thus long after the gonorrheal poison has lost its virulency in the lower vaginal canal, the os and cervical canal will continue to be the field for gonococcus activity.

The urethral orifice, very much like the cervical canal, is also afforded a protection in a much less perfect degree and is, therefore, highly susceptible to the action of specific inoculation. While in the course of time a gonorrheal infection, involving the urethral orifice and the vaginal walls, may disappear, the diseased condition about the os and cervix uteri seldom shows any signs of abatement. Changes, however, may take place in the character of the discharge and cause it to resemble the secretions found in a nonspecific cervical leucorrhea.

The continuance of the discharge from an infected cervical canal must be ascribed to the activities of the gonococci deeply imbedded in the compound racemose glands. It must be borne in mind that the mucosa of the uterus is intimately connected with the underlying muscularis, there being no submucosa, and that these compound ducts or laminæ and nabothian glands penetrate deeply into the surrounding fibromuscular stroma. Thus it can be readily understood how well a gonococcus can ambush himself and remain defiant for a long time.

In considering the treatment of a leucorrhea the underlying principle must be the arrest of the discharge, the removal of the local disorder upon which the discharge depends, and the relief of any constitutional disorder with which the leucorrhea may be connected, either as cause or effect.

Undue prominence should not be given to either constitutional or local treatment. In some instances constitutional measures will alone arrest the discharge, while in other cases a local treatment will be sufficient without the adoption of general measures. The great majority of cases require both local and constitutional measures to insure a

permanent cure. If we depend upon local or constitutional treatment alone, the discharge, after an apparent cure, is prone to recur.

It should not be overlooked that gross pelvic pathologic conditions and the lesions of the cervix, incident to childbirth, should receive the proper surgical care, otherwise the efforts to rid the patient of her discharge may prove useless. Even a lacerated perineum must be given consideration. It may be responsible for certain degrees of vaginal and uterine prolapse and should be repaired before a successful coping with the discharge can be expected.

Leucorrheas of specific origin will remain obstinate unless the constitutional taint of syphilis is removed, necessitating of course a special treatment.

In leucorrheas the result of gonorrheal infection, one of the most frequent and most obstinate maladies of the present day, many of the fondest hopes have been shattered upon the rock of sapiens. Time is perhaps our most favored ally, as it is a very tedious undertaking to destroy the virulency of a Neisserian gonococcus.

Inasmuch as a chronic leucorrhea has its favored abode in the mucosa of the cervical canal, creating a local pathology known as chronic endocervicitis, the treatment of necessity must be directed to this part of the uterine body. Cleanliness is the prime requisite. However, it must be stated that cleanliness such as it is usually carried out by the patient in the way of douches is of little avail. In fact ordinary douching, so frequently advocated in vaginal discharges, will do no good in a pathologic leucorrhea and had better be discontinued.

The first step in the treatment of a pathologic leucorrhea, or for that matter any type of leucorrhea, is a thorough cleansing of the vagina and cervix with liquid soap and warm water to be followed with an ablution of an alkaline solution. The canal of the cervix must be freed of its mucous deposits and cleansed in a like manner. If the os is very small or narrowed by an acquired stenosis, thereby hindering the cleansing, it is to be gently dilated to obtain proper accessibility. Should lesions be present, the result of birth trauma or the sequelæ of leucorrheal irritation, their treatment must receive precedence over the treatment of the discharge. Some of these lesions such as cervical erosions and ulcerations often heal following an application of solid nitrate of silver, pure carbolic acid, or a mixture of thymoliodide, 10 per cent in cod liver oil. Other lesions, such as hypertrophy and hyperplasia with ectropion of the cervix showing granular inflammation of its exposed mucous membrane, demand either a trachelorrhaphy, a trachelorrhaphy or in the more severe cases an amputation of the cervix. Furthermore vaginal crevices, vulvar pockets and the periurethral ducts must be thoroughly exposed, usually by incision. These recesses are favorite haunts for the gonococcus. All operative measures must be governed by the conditions as they are interpreted

by the attending gynecologist. They may prove successful and they may result in failure.

In those conditions where the vaginal walls have suffered a loss of tone from the destructive potency of the discharges with a tendency to relaxation bordering on prolapse, a hard rubber ring pessary or a Gehrung pessary should be introduced to prevent attrition of the vaginal walls. An important requisite in the successful management of a chronic leucorrhea is the gentle tamponade of the whole vaginal canal, not with an ordinary tampon, but with soft fluffy gauze. A good tampon can be obtained by taking a gauze bandage 1½ inches in width and boiling it until all starchy matter has been removed. It is then allowed to dry. This makes an ideal gauze for packing. As long as the patient is under the direct care of the gynecologist any douching or irrigating by the patient should be prohibited.

After recovery from a plastic operation on the cervix uteri, the discharge may cease or it may be reduced. It is usually the case, however, that it continues unabated. This can often be ascribed to a mixed infection. The discharge under such conditions is one closely allied to a leucorrhea without any visible lesion, and a local treatment is most helpful and promises much. The sole object of the treatment is to reestablish as speedily as possible the impaired tissue defenses of the affected structures. No time limit can be placed on a local treatment. It may bring an appreciable change in three months and it may require twelve months before any result is obtained.

The application of the methylene-glycerin solution as practiced by R. Stafford Foss, of London, has given very satisfactory results in my hands. A strip of gauze is saturated with the solution, packing it into the cervical canal, about the cervix and the upper portion of the vagina, and allowing it to remain for 24 hours. It is then removed and a fresh packing introduced. This procedure is continued for five days. A dry packing is then substituted for two following days. The treatment is continued as long as the discharge persists. Another treatment of merit with a technic similar to the methylene-glycerine solution, is a 5 per cent picric acid solution in 25 per cent alcohol. A tampon saturated with this solution is allowed to remain for eight hours. The gauze is then withdrawn and a dry packing introduced. Bisulphate of quinine in solution of 40 grains to the ounce of water, applied in a similar manner as the methylene-glycerine solution, has given very good results.

A treatment most ably worked out by Drs. Frank B. Block and Thos. H. Llewellyn of Philadelphia, and well worthy of trial is the acidulation of the vaginal canal with lactic acid bacilli. It consists in introducing a readily soluble lactic acid tablet against the cervix. No tampons are applied. No douching is permitted. The patient returns in a week and the same technic is repeated. This weekly implantation

of the bacilli is continued until the vagina shows an acid reaction. In favorable cases this acid state is obtained in 3 to 4 weeks. After the reaction has become acid, no treatment is given as long as it remains so. Reimplantation may become necessary at the end of four weeks. The authors state that the treatment is seldom a permanent cure but a good palliative measure requiring attention but once a month and superseding douches. The treatment, it must be said, is highly successful in senile vaginitis with its irritating discharge and almost intolerant pruritus.

Dr. Douglas H. Stewart, of New York, has suggested a treatment which in certain types of leucorrhea has proved very satisfactory. It consists in the application of a powder composed of sublamine, gr. 2, sodium citrate, gr. 40, alum, drams 3, sodium chloride, one-half ounce, lead acetate, drams 6, and sugar, q. s., 16 ounces. With this mixture the cervix and fornices are covered and a tampon introduced. An application is made about three times a week. Before the reapplication of the powder the vagina is douched with 36 per cent acetic acid solution.

In concluding, mention must be made of the excellent work of Dr. Arthur H. Curtis, of Chicago, in the treatment of chronic leucorrhea with radium. It has been Dr. Curtis' experience that the radium treatment has been successful where other measures have failed. The treatment is still in its experimental stage and the great danger of inhibiting the menstrual function has been its serious drawback. If this menace can be eliminated, radium undoubtedly will prove to be a most valued curative agent for chronic leucorrhea.

DISCUSSION

DR. ADAM P. LEIGHTON, JR., PORTLAND, MAINE.—I do not know of any condition for which women come to us for relief, that is more annoying than leucorrhea or dysmenorrhea. Of course, many times we can cure a case of dysmenorrhea through the medium of ovarian organotherapy, but I admit and confess that aside from those cases of leucorrhea which are due to vaginitis or specific endocervicitis, which I treat with iodized phenol, douches, and other applications, etc., my results in the treatment of chronic leucorrhea are not good unless I resort to surgical measures. Cases with laceration of the cervix, with leucorrhea, must be repaired. Trachelorrhaphy is necessary. It has been my observation that most of these cases of leucorrhea are due to erosion, and you may treat them forever without any good permanent results. I have made use of the Schroeder amputation quite extensively, which is well known to you, with 95 to 100 per cent good results in the treatment of these cases of leucorrhea due to endocervicitis or erosion which we cannot cure by other means. In the Schroeder amputation we excise a wedge-shape piece of cervix containing the columnar cell glands. Then we sew the cervical apices to the edge of the cervical canal anteriorly and posteriorly with transverse suturing of the cervical incision, thereby removing that tissue in which we find the cause of the leucorrhea.

DR. WILLIAM SEAMAN BAINBRIDGE, NEW YORK CITY.—Not only the internal secretions but toxic poisoning are related to these conditions. I have quite a series of cases, that I hope to tabulate very soon, which show that a large number of women who have a mild, persistent leucorrhea, contain in their economy a toxic substance resulting from intestinal fermentation. Very frequently the latter condition is eliminated or ameliorated, and although nothing is done locally for the leucorrhea, it often disappears as the patient gets into better physical condition. Many of these cases will be cured no matter what is done locally. In one series of cases where there was marked leucorrhea with lumps in the breasts and distinct chronic intestinal toxemia, I prescribed douching, and in another series I omitted this procedure. In both, the stasis was treated. Insofar as I could determine, the results in both sets of cases were practically equal. This would make it appear that the underlying general condition of the patient was the main factor and not the local condition.

I have found picric acid of value. It does not burn; it seems to have a certain protective effect upon the skin by slightly tanning it. I use 5 per cent in 75 per cent alcohol. It is particularly of value around the external genitalia where the danger of burning with iodine is marked.

DR. REDER (closing).—A woman will tolerate a certain amount of leucorrhea which can usually be controlled by an alkaline douche or an astringent suppository, but when she is compelled to wear a napkin she objects. She wants something done.

In regard to the Sturmdorf operation, which was referred to, i.e., a conical excision of cervical muscularis and endocervical mucosa, I cannot speak as favorably as I would like to. The operator does not remove all the tissues that harbor the bacteria responsible for the discharge. An excision according to the technic of Schroeder, i.e., an excision of a square block of the cervical tissue up to the internal os, has given better results in my hands. With an infection extending up to the internal os, it is necessary to remove all tissue from the external to the internal os. Frequently, with the Schroeder operation you will not succeed and a cervix amputation will become necessary. I have been more successful with amputation of the cervix and should give this operation the preference, provided the woman has her family and is near the climacteric period.

SUBMUCOUS ADENOMYOMA

By Otto Henry Schwarz, M.D., St. Louis, Mo.

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ACCORDING to Cullen's classification of uterine adenomyomata, these tumors are divided into three types; namely, the diffuse adenomyoma of the uterine wall, the subserous, and submucous variety. The diffuse adenomyomata are surprisingly common, and this fact is particularly appreciated by those who, as a routine procedure, study microscopically uteri removed at operation. Subserous nodules of any considerable size are by no means common, but small subserous adenomyomata in the vicinity of the uterine horns are seen not infrequently. The submucous variety, however, is quite rare, particularly those tumors which attain any considerable size. Recently after encountering a very remarkable case of this type and after studying the literature, I was surprised to find that with the exception of Cullen, the subject has been given very little attention.

Cullen, in 1897, in one of his earliest articles on adenomyoma described a small polyp springing from the anterior wall just above the level of the internal os. The body of the polyp was the size of a hazelnut and was composed of smooth muscle tissue penetrated by uterine glands. In discussing the subsequent changes which may occur in diffuse adenomyoma of the uterine body, he again mentions his case of small submucous adenomyoma and also describes the cases of Schatz and Diesterweg reported in 1884 and 1883 respectively.

In Schatz's case the uterus was 16 cm. long, 8.5 cm. wide in diameter, the wall varying from 2 to 2.5 cm. in thickness. The entire cavity contained five rows of broad base polypi. Each row consisted of from two to six polypi, varying from the size of a pea to a hen's egg, and the uterine cavity was completely filled with them. The polypi were made up of muscle tissue and glands which were embedded in a tissue made up of spindle-shaped cells. The glands were lined by a single layer of cylindrical cells, and where there was some dilatation of the glands the epithelium was definitely of a cuboidal type. Many small myomata were present in the uterine wall which were not easily shelled out. Those near the interior cavity showed some cystic dilatation. Cullen states that it would appear that in this case there had been a diffuse adenomyoma and the uterus was trying to free itself of the new

growth in the same manner that it extrudes an ordinary myoma, accordingly the polypoid condition would naturally result.

In Diesterweg's case there was a nodule the size of a hen's egg with a pedicle one inch thick springing from the uterine cavity. The walls were 1.5 inch in thickness and its center occupied by a large cavity. The inner surface presented numerous small depressions giving an appearance resembling a ventricle. There was also a smaller cavity the size of a cherry. The walls presented a typical appearance of fibromyoma and the cavities were lined by cylindrical ciliated epithelium. They were filled with brownish-black blood. Two years later another submucous tumor, 9x7x6 cm., was removed from the same uterus. It was composed of myomatous tissue and contained a cyst the size of a walnut. The cyst was lined by cylindrical ciliated epithelium and filled with blood.

After describing these tumors and assuming that these cases belong to the same type as he described, Cullen pictures three stages: (1) The diffuse adenomyoma; (2) the polypoid stage; and (3) the gradual expulsion of the polypi. He further states that we know uterine myomata usually commence in the interstitial layers of the uterus and in time pass inward toward the uterine cavity or outward toward the peritoneal surface. He feels that in the diffuse adenomyoma of the uterine wall it is equally probable that portions of the growth will in time be separated and forced toward the peritoneal surface. In 1909, in his monograph on adenomyoma, Cullen divides uterine adenomyomata as follows: (1) Adenomyomata, the uterus preserving a relatively normal contour; (2) subperitoneal or intraligamentary adenomyomata; and (3) submucous adenomyomata. He states that submucous adenomyomatous tumors are certainly not very common. He describes four cases of his own. Three of these were quite remarkable; in one of them a submucous tumor was removed, vaginally; it was a case of double vagina and cervix; the tumor was 11x7x7 cm. in size and diameter, and was well within the uterine cavity. In another case, a globular mass filled the entire vagina, projecting from the cervical canal, and was attached to the uterine wall by a small pedicle. The tumor was bisected and removed by ligating its pedicle. The third case was the most remarkable of all. The specimen consisted of the entire uterus with a large tumor projecting into the uterine cavity, filling it entirely, and extending through the uterine wall to the right and posteriorly, and extending between the layers of the broad ligament. The submucous portion measured 7 cm.x 6 cm., while the intraligamentary portion was approximately 10 cm. in diameter. Outside of the tumor area the myometrium showed no evidence of adenomyoma. Histologically these tumors were all made up of a myomatous matrix with dilated spaces lined by cylindrical epithelium; some of the cavi-

ties appeared as miniature uterine cavities. Many of them were filled with clotted blood. With the exception of reporting the additional cases, which to my mind clearly illustrate the author's assumptions made concerning these tumors in 1897, Cullen apparently had nothing further to add concerning these tumors.

Lockyer, 1918, in his monograph, in which he deals with adenomyoma most extensively, mentions submucous adenomyoma. He does not feel that small polypi, containing uterine glands and muscle tissue, should be classified as adenomyoma, but states with the large sessile submucous growths it is a different matter. He describes and illustrates a very interesting case of his own which was removed by Armand Routh. The uterus was removed by vaginal hysterectomy in two pieces, having been divided at the internal os. The entire uterus measured five and one-half by three inches; at the internal os the cavity was divided into two canals, a projecting adenomyomatous cystic growth dividing the cavity; the growth penetrated the uterine wall to the tubal angles. The point of discussion in this case was whether they were dealing with a submucous and subserous sessile growth, or whether the adenomyoma arose in a septate uterus. These submucous adenomyomata, as we have seen, are comparatively rare. This, indeed, is in marked contrast to ordinary discrete uterine myomata. The latter are commonly seen in all stages from an early submucous tumor to one that has been entirely expelled from the uterine cavity.

The infrequency of submucous adenomyoma, I think, can be readily explained. In case of diffuse adenomyoma of the uterus, the lesion involves the uterine wall in a very general way; the muscular hyperplasia of the wall with penetrating islands of uterine mucosa usually involves a greater portion of the uterine wall. Even if the involvement is not complete it is most difficult to separate the abnormal from the normal wall. Therefore, on account of the completeness of lesion in many instances, very little normal uterine wall remaining, and also in those cases which are less extensive, where there is such an intimate relation between normal and abnormal tissue, it is exceedingly difficult for the remaining normal tissue to expel the adenomyoma into the uterine cavity. The diffuse adenomyoma of the uterine wall is frequently associated with discrete myomatous nodules, and under such circumstances the discrete nodules more readily become submucous.

This markedly diffuse character of the growth is strikingly brought out when studying Cullen's 56 cases of diffuse adenomyoma reported in his monograph. The first illustration in his book, however, shows a diffuse adenomyoma which is definitely localized in the uterine wall and shows a distinct tendency toward becoming submucous. I have included the illustration in my paper to bring out this point and to contrast it with the case I am about to describe. One can readily con-

ceive how this tumor could be pushed into the uterine cavity, there being at least three-fourths of the normal uterine wall present to expel it.

Another factor, which must be considered when discussing the infrequency of submucous adenomyoma, is purely a clinical one. It is to be remembered that diffuse adenomyoma of the uterine body usually causes very marked clinical manifestations chiefly in the form of profuse and prolonged menstruation with a marked dysmenorrhea. Therefore it is quite logical to assume that the patient presents herself comparatively early, at least long before the lesion develops into the submucous variety.

My experience with submucous adenomyomata is limited to three cases, two of which were small polypoid masses, both about the size of a hen's egg and connected by a pedicle to the uterine wall. These are of interest, however, both on account of their size and on account of the fact that the uterus was not removed subsequently.

The third case is a most remarkable specimen. I wish to place this on record for several reasons: first, on account of its enormous size; second, because it clearly substantiates all of Cullen's ideas as regards the origin of these tumors; third, because it has most unusual characteristics, there being only one tumor in the literature, so far as I know, which has a similar structure, a case of large bilobed subserous tumor described by Robert Meyer; and fourth, because Meyer regarded his case as arising from the Wolffian duct or the epoöphoron, while the tumor in my case is clearly one of Muellerian origin.

CASE REPORT

Clinical history: Patient, married, forty-four years of age, entered Barnes Hospital complaining of a continual bloody vaginal discharge. Her family history and past history are unimportant. Patient had had no previous operations. Menstrual history began at the age of thirteen, twenty-eight to thirty day type; no pain or clots; of three days' duration, moderate in amount. Last period May 20, lasted three days. No disturbance until beginning of present illness. Married twenty-four years; no pregnancies; husband living and well. Present illness: About seven or eight years ago patient began to have pain during the menstrual period. The pain has become progressively worse; during the last two periods the pain was so severe that the patient was compelled to go to bed for three days. About six years ago she began to have a slight bloody discharge between the periods, and menstruation being more profuse and occasionally prolonged. At first the irregular intermenstrual flow was only enough to slightly soil the clothes and would come and go; at present the flow is almost constant, there being only an occasional intermission; the flow is never profuse, however, nor is there any pain during this time.

General physical examination negative. Abdominal examination: A mass, the size of a large orange, present in the left lower abdominal quadrant; freely movable, firm, more or less globular, arises from and is, apparently, attached to some pelvic structure. On vaginal examination a large globular mass is found filling the entire pelvic cavity. The vaginal portion of the cervix is flattened out and the external os is rounded and dilated about 1 cm. Its margins are about 4 mm. thick;

the cervical canal being almost entirely obliterated. On palpation through the cervical external os a large, soft, rounded mass is felt. This mass is a submucous tumor of some sort, distending the entire uterine cavity.

Diagnosis: Subserous and submucous myomata of the uterus. Recommended a panhysterectomy. Hemoglobin 70 per cent; other laboratory findings, negative.

Operation: Panhysterectomy; midline incision from symphysis to umbilicus. The uterine body is globular and about the size of an average man's fist. The fundus came directly into the incision, and the uterine body was readily delivered through it. Both adnexa were negative. Filling the pelvis and the entire cervical canal was a large mass about 12 cm. in diameter and firmly fixed in the pelvic cavity. On account of its size it was immovable even after freeing the bladder and severing the broad ligaments down to the uterine arteries. The body of the uterus was amputated at the level of the reflexion of the peritoneum anteriorly. After amputation it was noticed that the uterine wall on the left side contained a coarse, infiltrating growth from within outward, penetrating about one-half the thickness of the uterine wall. This infiltrated area marked the upper attachment of the pelvic tumor. The anterior and posterior walls were now incised from above downwards for the distance of about 6 cm., when the tumor was found to be attached by a broad base along the upper left and posterior portions of the dilated lower uterine cuff. The anterior wall was only slightly involved in the attachment of the tumor. The tumor was then separated from its attachment by dissection with the finger, leaving a grayish yellow area of about 6 cm., similar to the infiltrating tissue described above. After considerable difficulty the cervix was completely removed and the operation finished in the usual manner.

Gross description of the tumor: The specimen consists of three pieces; the body of the uterus with a submucous myoma, the lower submucous tumor, and the large cervical cuff. The body of the uterus measured 9 x 7 x 6 cm. and presented two myomatous nodules; one, a submucous affair sessile in character, 6 cm. in diameter, and filling the upper uterine cavity; another, an intramural capsulated myoma in the posterior wall, 4 cm. in diameter. With these exceptions the uterine wall showed nothing unusual and in its thickest portion measured 24 mm. including the mucosa, which was normal. At the lower portion on the left side, where the uterus was amputated at the time of the operation, was an infiltrated grayish area perforated by numerous minute cystic cavities. This area extends 1 cm. upward, 15 cm. into the uterine wall, and 2 cm. along the surface. It represented the upper portion of the attachment of the lower tumor, and in no other portion of the uterine wall, except below in the removed uterine cuff over an area of about 4 cm., corresponding to remaining attachment of the tumor, is this infiltration process seen. The cervical cuff, which was markedly thinned out, showed a comparatively smooth inner lining, the wall varying from 5 to 7 mm. in thickness. With the exception of the above-mentioned area, which was continuous with the infiltrated area described in the uterine wall, no involvement of this portion of the uterus could be made out. The infiltration process involved the wall similar to the attachment in the upper specimen, but the walls were infiltrated less deeply as the lower attachment of the tumor was approached. At no place did it go through the entire thickness of the uterine wall; in other words, the external surface over the entire lower uterine cuff was uninvolved. The tubes and ovaries were both normal and showed nothing unusual in the gross examination.

The lower submucous tumor measures 11.5 x 7.5 cm. It is irregular in outline, has an uneven surface, and is covered over its lower and right lateral surface by numerous cystic projections. The area by which the tumor was attached measured 6 cm. in diameter, was grayish yellow in color, very firm and similar to infiltrative tissue in

uterine wall. This former attached surface was rather ragged, owing to its separation from the uterine wall at the time of operation. The posterior surface presented numerous cystic areas, and also over an irregular area, about 5 x 2.5 x 3 cm., the surface presented numerous capillary excrescences; these vary in size from a fraction of 1 mm. to 4 mm. in diameter, and are raised from the surface from a fraction of 1 mm. to 1.5 cm. in height.

The tumor was then sectioned through its attachment in the anteroposterior direction. It was made up of comparatively solid tissue, perforated by innumerable open spaces varying from a pin point to 1.5 cm. in diameter. Several of the larger cavities presented marked intracystic papillary projections; in some instances these filled almost the entire cavities. These papillary projections are identical in appearance to those found on the outer surface; they are grayish-yellow in color and have a firm consistency. The lower portion of the tumor, particularly the lower third, is almost entirely cystic; the cysts are unusually large, have a very smooth lining, are filled with a clear gelatinous substance and contain very thin, paper-like septa separating one cyst from the other. The gelatinous material above mentioned is clear in all but one cyst in which there has been evidently a hemorrhage which gave it a light chocolate brown color. These cystic cavities vary from 0.5 cm. to 3 cm. in diameter and are of varying length, the largest being 5 cm.

Microscopic Description.—A section taken from the base of the tumor was composed essentially of muscular tissue and glandular elements. The glands were lined by a single layer of cells which varied in height from a columnar cell to a low cuboidal cell according to the amount of gland dilatation. The contour of the gland lumen was quite varied, there being all sorts of irregular shapes, many of which showed marked projections into the lumen of the gland giving a picture not unlike that observed in cases of intracanalicular adenofibroma of the breast. These glands, of various sizes, are so numerous that they fairly riddle the muscular matrix. In many instances around both the small and dilated glands is seen a connective tissue of considerable extent, made up of fusiform cells with long spindle-shaped nuclei. This connective tissue rests directly upon the smooth muscle matrix and in many places is exactly identical with the stroma of the endometrium. In many instances the glands both dilated and undilated seem to rest directly upon the muscle tissue. The smooth tissue is identical in structure to the smooth muscle tissue of the uterine wall. The intracanalicular projections, which are seen throughout the specimen, are made up for the most part of muscle tissue lined by a single layer of low columnar epithelium. In some instances there is imposed between the lining epithelium and the muscle tissue of these projections a definite layer of the endometrium-like stroma tissue. In other instances this stroma tissue is lacking. Occasionally some of the projections have a muscular matrix riddled with glands, some with and some without this surrounding stroma tissue.

Section along the posterior wall of the tumor, including the papillary projections: These papillary projections are all lined with a single layer of columnar epithelium. This epithelial lining invades the muscular tissue with deep, gland-like invaginations. In some instances this epithelial lining rests directly on the muscular matrix and in other instances there is a definite intervening layer of connective tissue between the epithelial lining of the glands and the muscular stroma. The sections through the large dilated cystic cavities show that these cavities are all lined by a single layer of cuboidal epithelium. In some instances these lining cells rest upon the muscular matrix and in other instances there is a definite intervening stroma of connective tissue.

Section taken through the uterine wall at the base of the tumor shows the inner half of these sections perforated by numerous glands, some showing considerable dila-

tations, but none are dilated more than 2 mm. This tissue answers the description of the ordinary diffuse adenomyoma of the body of the uterus, especially in the deeper portions of the uterine wall. The endometrium-like stroma is particularly striking, and here and there large patches of it can be seen surrounding the glands. The other half shows a normal muscular structure of the uterine wall and is entirely devoid of glands. This penetration of the uterine wall by glands is only present through the area where the tumor was attached, extending a few mm. below and then continuing upward for about 1 cm. Numerous sections taken through the uterine wall, with the exception of a slight general thickening of the myometrium, show it to be entirely normal. Sections taken through various portions of the lower uterine cuff show it to be lined by a single layer of low columnar cells with a thinned-out uterine wall which is entirely devoid of glands. Only here and there in the lowest part is there even a suggestion of cervical glands, and these are directly continuous with the lining of the cells of the canal. The discrete nodule in the upper portion of the uterus is an ordinary myoma and has no glandular inclusions.

From the above description, one can readily see that we are dealing with a submucous tumor of considerable size with a broad sessile at-

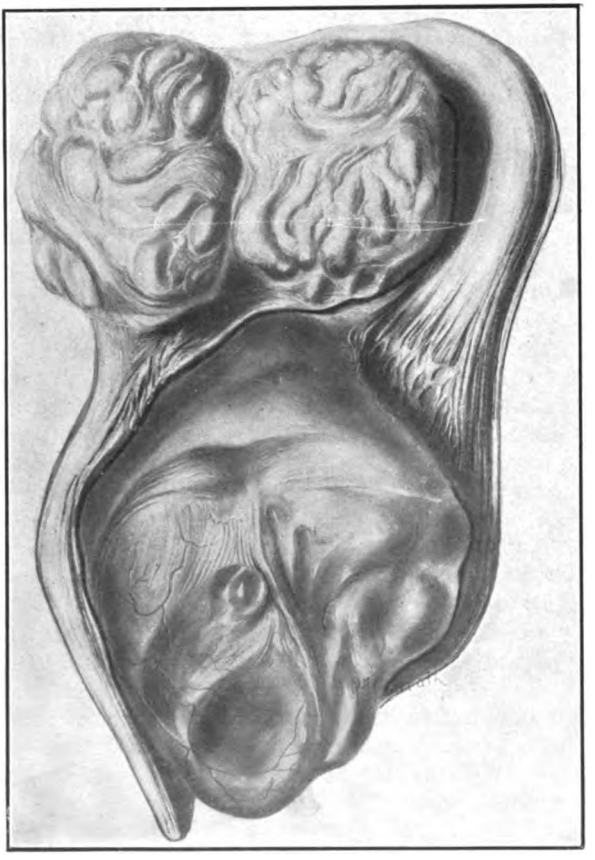

Fig. 1.—Drawing of uterus and tumors, reconstructed after operation. The uterus is cut along the anterior wall exposing the cavity and the two tumors. The upper tumor is bisected; the lower tumor completely fills the lower uterine cavity and shows its attachment laterally to the uterine wall. The coarser structure immediately adjoining the attachment of the tumor represents the extent of the infiltrated adenomyoma.

tachment to the uterine wall. The structure of the tumor is a muscular matrix in the substance of which are embedded glands, a considerable number of which surround cystic cavities, and for the most part they are identical with the glands of the endometrium; in many

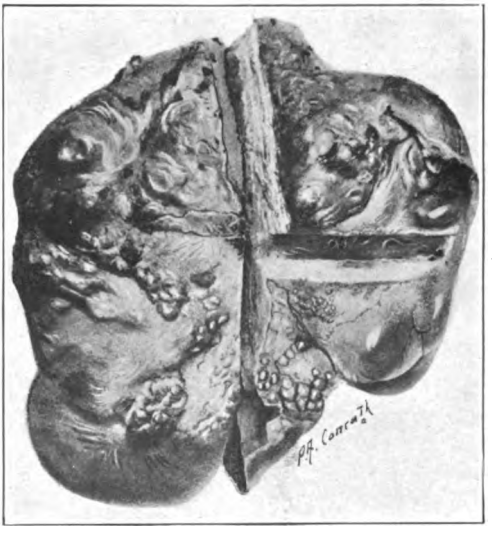

Fig. 2.—Posterior view of the tumor. The extreme upper half and central portion represent the area which was attached to the uterine wall; the slightly elevated projections seen in the lower portion of the picture represent the papillary excrescences.

Fig. 3.—Cross section of submucous adenomyoma showing the muscular stroma perforated by countless numbers of slightly dilated glands. Large cystic cavities are seen along the inner and lower portion of the picture. The intracanalicular portions can be made out in several places.

instances these glands are surrounded by an endometrium-like stroma. The involved portion of the uterine wall at the site of the former attachment of the tumor has the same structure which is characteristic of ordinary diffuse adenomyomata. This adenomyomatous structure

is only present at this site, and infiltrates the uterine wall about one-half the distance to the serosa; the uterine wall elsewhere is entirely free of adenomyoma. We also note beside the cystic dilatation of the glands intracanalicular polypoid projections in the cystic cavities, not at all unlike intracanalicular adenofibroma of the breast.

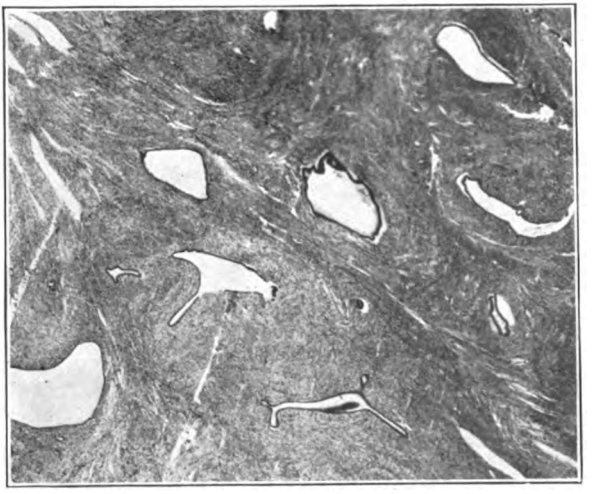

Fig. 4.—Photomicrograph, low power. The muscular matrix perforated by numerous glands which show varied differences in outline and degrees of dilatation.

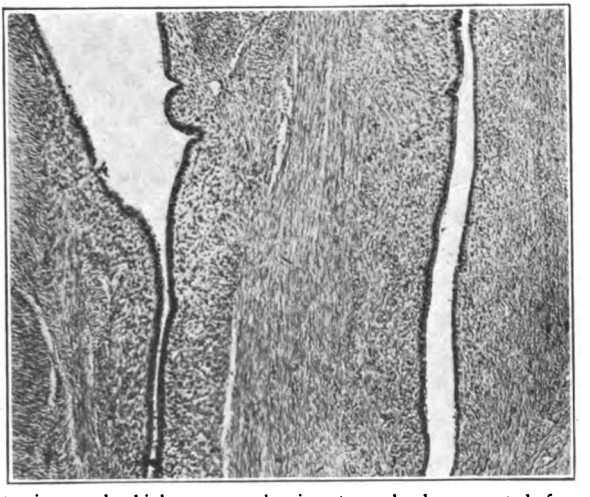

Fig. 5.—Photomicrograph, high power, showing two glands separated from the muscular matrix by an indefinite area of connective tissue stroma. This is particularly striking along the lower boundary of the upper gland.

I feel that the above characteristics concerning the structure, location and relations of this tumor, show rather conclusively that we are dealing with an isolated diffuse adenomyomatous growth on the wall of the uterus, which remained localized and continued to grow as a

localized tumor. As a result of pressure exerted on it by a surrounding normal uterine musculature, it was gradually expelled into the uterine cavity. The fact that the tumor filled the cervical canal can be explained by the previous filling of the upper uterine cavity by the discrete submucous myomatous nodule in this location. The adenomyomatous growth in its earlier stage must have been very similar to the case of Cullen's, the illustrations of which I have taken the liberty to insert in my paper. (Fig. 9.) Therefore, the source of the gland elements in my tumor were, originally, from the endometrium and, accordingly are of Muellerian origin.

The question might be raised: Why do not all of these glands have the pattern of the endometrium? We note that, in some instances, around both small and dilated glands there is an absence of the endo-

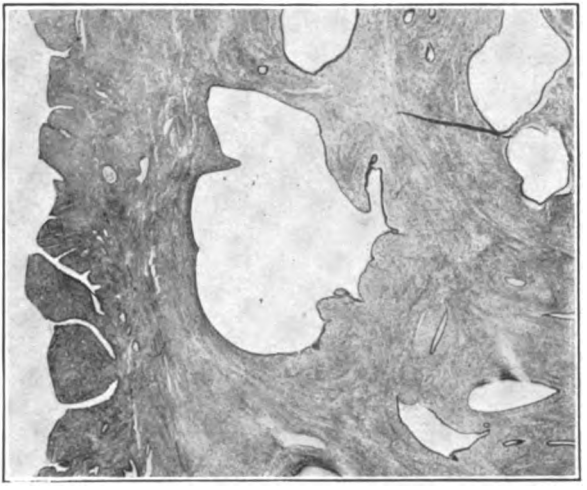

Fig. 6.—Photomicrograph. Section taken through the periphery of the posterior wall to an area which shows papillary excrescences. The structure of the tumor is also well seen in this picture.

metrium-like stroma. On the other hand, this endometrium-like stroma surrounds in varying degrees all sorts of glands, both large and small, throughout the tumor, being more marked in the base of the tumor and in that portion immediately adjoining the base. On account of the marked pressure which has been exerted on the tumor by the surrounding uterine wall, and on account of pressure which has resulted in consequence of the marked gland dilatation, this stroma tissue could readily have become obliterated. It is also quite justifiable to assume that the gland tubules could have penetrated the muscular matrix of themselves, the stroma being held on account of the increasing pressure.

So far as I know there is no case described in the literature with a histologic structure, which resembles to any great degree that of my

case. Robert Meyer reported a pedunculated subserous adenomyoma springing from the right uterine horn which in gross appearance, and histologically resembled my specimen very much. Meyer regarded his case one of Wolffian duct, or of parovarian origin, on account of the marked resemblance of the glands in his case to these structures. Meyer reported his case in 1903 and at that time stated that the specimen had no parallel. This statement apparently holds good today. Lockyer in his recent monograph describes this tumor in great detail and reviews Meyer's ideas concerning its origin thoroughly.

Meyer's tumor was bilobed, each lobe the size of a man's head and connected to the right uterine horn by a single pedicle. The tumor was made up chiefly of cysts and canals held together by matrix of connective tissue and smooth muscle. The cyst and canals were lined

Fig. 7.—Photomicrograph, low power. Uterine wall at the attachment of the lower submucous tumor. The glands penetrate about half way through uterine wall. The serosa is not included in the picture, but the section represents practically the entire thickness of the uterine wall. Note the surrounding stroma of the glands.

Fig. 8.—High power of adenomatous area in Fig. 7. Shows uterine glands with a characteristic stroma embedded in the uterine muscle.

by a single layer of cylindrical epithelium. At the site of attachment of pedicle tumor, there was a diffuse adenomyoma of the uterine wall and the canal system was traced directly into the uterine cavity.

Meyer has applied the term "organoid" to this tumor on account of the arrangement of the muscle around the canal system. He states that the only organ from which such a tumor could rise is the Wolffian duct and epoöphoron, and feels that the adenomyomatous state of the uterine wall had no genetic relationship with the tumor. Meyer explains the mucosal invasion of the pedicle as due to pressure exerted on the uterus by the tumor mass, as the result of which the

mucosa is squeezed along the lines of least resistance into the pedicle of the tumor.

Lockyer states that, so far as he knows, Cullen has never pronounced judgment on this tumor, but should expect him to regard it as an example of his variety of subperitoneal adenomyoma. From this description, the only essential differences between my tumor and Meyer's are: first, the fact that he is able to describe clear-cut muscle layers about the various glands and cysts, and that he regards this system as a long tortuous duct; second, he occasionally speaks of a connective tissue content of the tunic layers, but describes no definite layer of connective tissue, which were quite marked in my tumor.

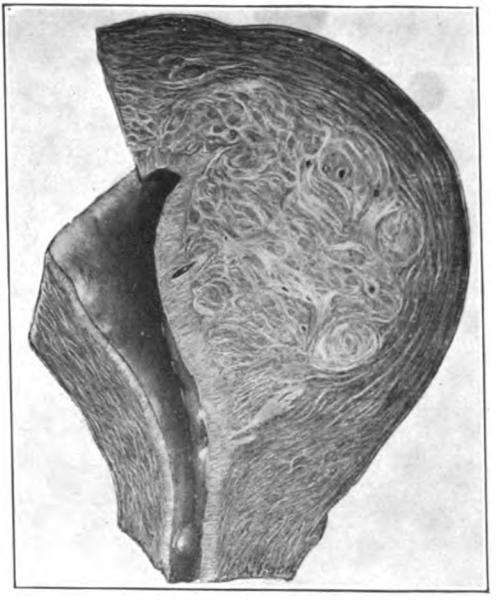

Fig. 9.—Photograph of Fig. 1, from Cullen's monograph on "Adenomyoma of the Uterus," shows a localized adenomyoma of the uterine wall with a slight tendency to being pushed into the uterine cavity. This picture represents a lesion which might be regarded as an early stage of a submucous adenomyoma.

Judging from the drawing of Meyer's tumor, the duct system he describes is not apparent as he claims, and in his other illustrations the laminated tunics about the canals do not appear to stand out clearly as his descriptions would lead one to believe. The fact that Meyer's tumor was directly connected with the uterine cavity, and the fact that there was definitely a diffuse adenomyoma of the uterine wall, must certainly bear considerable weight in considering this tumor primarily as part of a diffuse adenomyomatous condition of the uterine wall. The cystic dilations and the intracanalicular projections could readily be explained on mechanical grounds. Certainly these points cannot be totally disregarded, the more so since the sub-

mucous adenomyoma, which I have described with its cystic cavities and intracanalicular projections and which bears such a marked resemblance to Meyer's tumor, is definitely of Muellerian origin.

REFERENCES

Cullen, T. S.: The Johns Hopkins Hospt. Bull., 1897, vi, 133.
Diesterweg, Ad.: Ztschr., f. Geburtsh. u. Gynäk., 1883, ix 191.
Schatz, F.: Arch. f. Gynäk., 1884, xxii, 455.
Cullen, T. S.: Adenomyoma of Uterus, (W. B. Saunders Co.) 1908, p. 145, 156.
Lockyer, Cuthbert: Fibroids and Allied Tumors, (McMillan & Co.) 1918, pp. 303, 391, 403.
Meyer, Robert: Ztschr., f. Geburtsh. u. Gynäk., 1903, xlix, p. 464.

DISCUSSION

DR. JAMES E. DAVIS, DETROIT, MICHIGAN.—There is just one point to which I desire to call attention. I wonder whether a number of these cases have not been left out of the literature because of differences in classification. I imagine that in some cases the classification adopted has placed this same kind of formation with the fibrous adenomatous cervical polyp, or a myomatous, adenomatous polyp of the cervix.

DR. SCHWARZ.—The point which Dr. Davis makes is very well taken. There is no doubt that many of the smaller tumors are classified as ordinary polyps and, because of the fact that the uterus is not removed subsequently in such instances, the attachment of these polyps cannot be studied. Lockyer in discussing these tumors mentions the fact that he would hardly classify the smaller pedunculated tumors as myomata, but in the larger tumors in which the growth is sessile, as in my case, the term submucous adenomyoma must be applied.

BORDER-LINE CARCINOMA OF THE CERVIX AND ITS TREATMENT

By Edward A. Weiss, M.D., F.A.C.S., Pittsburgh, Pa.

IN view of the many different views that have been expressed regarding the palliative or nonsurgical treatment of cancer of the cervix, the question must still be considered an unsettled one and no definite conclusions can be formulated until a large number of cases are tabulated from different clinics. A study of reports in recent literature shows that there is a decided inclination to abandon operative procedures in favor of radium therapy, and the immediate results, generally obtained by this agent, are so favorable in contrast with some of the severe operative results, that the change seems almost justifiable. It should be remembered, however, that radium has not been used long enough by the large numbers of gynecologists to formulate a definite working technic, and too short a time has elapsed to speak of end-results in a large series of cases. Furthermore, the technic employed, the dosage of radium used, screening and other factors have not been standardized sufficiently to justify universal adoption. On the other hand the operative results, immediate and remote, have been carefully studied and followed up for twenty years, so that quite definite conclusions can be drawn regarding the comparative value of the different operative procedures; in other words, the operative treatment has been fairly standardized through the technic established by Wertheim, Ries, Werder and others. We feel that the study of the radium treatment, at this time, must be purely clinical and based on comparative results by those in a position to judge and to follow up the cases, mainly by the gynecologists rather than the physicist. A thorough co-operation of the two, however, is essential as there are many interesting chemo-biological questions to be analyzed.

For practical purposes we have endeavored to establish a clinical working classification of cancer of the cervix by dividing them into five groups. (1) Very early and favorable cases, definitely localized to the vaginal portion of the cervix. (2) Early cancer of the cervical canal with no palpable extension to the parametrium. (3) Borderline cases, that is, cancer with a moderate amount of tissue friability and fixation of adjacent structures, which fixation may be malignant or inflammatory in character. (4) Advanced cases, with unquestioned extension and metastasis, and clearly inoperable, but suitable for palliative treatment. (5) Far advanced and hopeless cases, and not suitable for any form of treatment.

We still believe that Groups 1 and 2 are distinctly surgical and should

be treated along very radical lines following the technic outlined in the paper presented by the writer at the meeting of this Association in 1918 entitled "Radical Treatment of Cancer of the Cervix by Igni-extirpation (Werder Operation)." The immediate and late results of this procedure have been so satisfactory during the past ten years that the operation is sometimes undertaken, even in the more advanced cases of Group 3, especially if the patient is considered a good operative risk; this factor is a most important one in deciding on any type of operative procedure. It is the neglect of this precaution that sometimes causes a high mortality or severe morbidity and, consequently, discredits the surgeon's judgment.

Not infrequently it is a difficult matter to say when carcinoma uteri is really of the border-line type, for one surgeon may consider a case unfavorable which another may classify as fairly early or as a border-line case, and, therefore, too much emphasis cannot be placed on the importance of a careful study of the type of cancer at hand before treatment is instituted. Clinical experience has shown that the squamous-cell cauliflower type of carcinoma presents a far more favorable surgical aspect than the adenocarcinoma, so that when any attempt at classification is made or when a prognosis is given, this histologic difference must be kept in mind. The same may be said of the age of the patient, for it is well known that the prognosis in a young woman with cancer is always more doubtful than in one advanced in years; a third and still more definite factor is the immunity, or resistance, that some patients develop against further invasion of the cancer. Hence, with these uncertain factors to deal with in our classification, definite statements as to the operability and prognosis cannot be made. Adenocarcinoma of the cervical canal has given such unfavorable results in surgical treatment that we have of late classified this form as border-line cases even when seen in the early stage of the disease. The assertion by some surgeons, that this type of cancer is invariably fatal is, practically, borne out in our experience, and an unfavorable prognosis is generally to be expected when treated by purely operative measures.

When a diagnosis of cancer of the cervix has been made, appropriate treatment should be given at the earliest possible moment, nevertheless haste in operating is not always advisable. We have found from practical experience that preliminary preoperative rest in bed for several days results in a marked diminution in the size of the diseased cervix; but what is of more importance still is, that there is often noticed a decidedly less thickening and fixation of the broad ligaments, proving that the fixation was an inflammatory rather than a malignant invasion of the lymphatics of the broad ligaments. As a result of this observation we have frequently found that the supposedly inoperable case is really an operable one, or border-line case. During the period

of rest in bed, a more careful study of the patient's resistance can be made and, should radical treatment follow, the condition of the patient is greatly improved and becomes a better operative risk. When it is well established that there is only a questionable malignant involvement of the parametrium, bladder, or rectum, our problem is not an easy one. Before the advent of radium, the general opinion was to perform radical extirpation when there was any doubt as to operability. The result was a high operative mortality and a severe morbidity even in competent hands, so that some surgeons went to the other extreme and palliative treatment only was performed when operability was doubtful.

In the border-line cases, the improved Byrne cautery technic, which is practically the first stage of the Werder radical igni-extirpation, has given us the best results for many years; and while only a few so-called permanent, or five year cures, were obtained, yet we have had several instances of complete freedom from symptoms for periods of from three to five years. In thirty-eight border-line cases so treated, there was recurrence with death in one case, in six months; two, in nine months; five, in twelve months; five, in eighteen months; eight, in two years; five, in two and one-half years; two, in three years; three, in three and one-half years; two, in four years; one, in five years; and four cases could not be traced after the first year. In this series one death resulted on the fourth day from embolism. Vesicovaginal fistula occurred in one case, and rectovaginal fistula in one other, but were subsequently cured. Cystitis followed operation in three cases, and superficial burns on the vulva in six instances; the convalescence in these cases being protracted and annoying. In 21 cases, or over 50 per cent, the recurrence of the disease manifested itself, not at the site of the operation in the vaginal vault, but in the parametrium, in deep pelvic glands, or remote organs, proving that the cautery was valuable in curing the local disease. A general résumé of this series of our operative border-line cases, while showing a fairly satisfactory result for so serious a condition, also reveals the fact that recurrence takes place sometimes quite early, and that convalescence is slow, so that we are justified in adopting other forms of treatment in these definitely doubtful cases.

It is a well-known fact that, among the laity, the operations for cancer of the uterus are considered the most serious of all operations, and that this belief has a deterring effect and keeps them from seeking treatment early. Surgeons of limited experience appreciate their inability to cope with the disease properly, with the result that timely operation and treatment are delayed or improperly performed. Clark has stated the proposition most clearly when he says: "If an operation or other therapeutic procedure is to have a permanent place in our armamentarium it must be sufficiently easy to make it available, not

only for a few skilled specialists, but for the great body of surgeons. In these days of low mortality percentages attending nearly all the major operations, no operation can possibly gain headway which combines with it a shockingly high mortality and a large number of distressing sequelæ. It is possible that when we make a final summing of our combined experience we may have to accept the conclusion that a less radical operation even though it save fewer lives, may be preferable when attended by a low surgical mortality and few or no operative sequelæ."

Since the introduction of radium treatment of cancer by Hickham, 1906, the attitude of the profession has gradually changed from one of skepticism to that of confidence; and while the subject is still unsettled in many respects yet, through the careful studies of Kroenig, Bumm, Latzke, Schindler, and Legnen, previous to 1915, the way was paved for more exact study of the treatment. Since 1916 the carefully compiled statistics of Bergonie, Ransohoff, Schmitz, Bailey, Clark, and Janeway, confirm the early optimistic reports of radium therapy, at the same time pointing out the danger of indiscriminate and unscientific use of the remedy.

The results obtained by us with radium in a collection of advanced or inoperable cases were so striking, that in a series of forty-five border-line, or Group 4 cases, radium instead of the cautery was used; and, while the results were disappointing in some instances, we are forced to admit, after taking all factors into consideration that, in a small series of cases, radium has proved to be a most valuable adjunct, both as to immediate and remote results. To say that radium used in the cervix is a harmless procedure, is not in accordance with facts and its indiscriminate use will bring discredit on a very valuable adjunct in our gynecologic therapy. A glance at recent literature on the subject shows that almost every radiologist has evolved a technic of his own, some using one massive dose, others small amounts once, or repeated, and others a combination or variation of both methods. It is generally admitted that small dosage is safer even if less effective, a state of affairs practically analogous to palliative and radical operation. Follow-up and end-result reports from various centers show that overdosage frequently results in dangerous sequelæ such as absorption, ptomainemia, necrosis, fistula, infection and obstructive cicatrices. Our observations lead us to believe that small doses, 50 to 100 mg., used twenty-four to forty-eight hours, have given less dangerous sequelæ than massive dosage.

The technic employed in this series of strictly border-line cases has varied somewhat. The majority of those using radium in the cervix object to preliminary operative treatment of any kind. Bailey, in reporting his cases, states that he believes that the use of the cautery is not efficacious for the cure of cancer and the use of radium, follow-

ing the operation, is not advisable for the tendency to fistula formation in the tissue, that has been partly desiccated, is very great, and hence the Percy operation as a preliminary to radium treatment has been discontinued by him. This unfortunate complication, no doubt, has frequently occurred after extensive cauterization. In 15 of our 45 border-line cases treated by radium, we have performed not the Percy but the high cautery amputation of the cervix followed by radium, using 1200 to 2400 mg. hr., and in none of these cases was there fistula formation or other untoward results. The other thirty cases were treated by radium alone and, although the cases are too recent to form definite conclusions, yet we believe that especially in the cauliflower type, the most favorable results are obtained by a combination of high cautery amputation and radium.

In using the cautery in the treatment of border-line cancer, a clear distinction must be made between the so-called Percy cauterization and high amputation by the cautery. In the former the cervix is not removed but a deep charring results which is often followed by fistula formation and severe constitutional reaction. The subsequent use of radium would not only be of little value, but would increase the tendency to fistula. The amputation of the cervix with the cautery, however, is rarely attended by such complications and when they occur it is the result of an operation improperly performed. Furthermore, the amputation removes the diseased area without severe cicatricial formation, so that radium can be applied later in an almost healthy area. The radium treatment then is practically used as in an early stage of the disease and a relatively small amount of radium may be employed. It is sometimes remarkable how rapidly the fungating friable cancer tissue disappears when radium is used in the cervical canal and in the vaginal fornices. The result, however, is a marked contraction and dense fibrosis; the vaginal cervix being replaced by a heavy, unyielding scar. The cautery, on the other hand, removed the cervix, leaving a clean granulating area after several days. It may be asked: Why use radium when the cautery removes the diseased tissue? The difference is that, in the light of our present experience, heat destroys the cancer cells only to a limited distance from the cautery; whereas, the radium exerts its influence to a much greater degree throughout the pelvis, and thus arrests or destroys the outlying cancer cells.

Schmitz has recently pointed out that, in properly selected cases, a radium capsule placed in the canal of the cervix will distribute rays evenly through the pelvic cavity and that the rays, properly screened, must penetrate six centimeters of tissue all around with such intensity at the periphery that carcinoma cells at this distance become destroyed. While it is necessary to so place the radium within the cervical canal as to reach the periphery of the cancer tissue, it must be borne in mind that the bladder, rectum, and ureter, are subject to radium injury.

It is still an unsettled question how resistant normal tissue is to radium, but it is conceded that cancer tissue is about one and a half times more sensitive to radium than healthy tissue. Nevertheless, it is a precaution, as Schmitz pointed out, to have the bowels, and the bladder kept empty during the time radium is in the cervix. A full rectum or distended bladder would push the walls of those organs one to one and a half centimeters closer to the radium and subject the walls to unnecessary and perhaps dangerous radiation.

The question is frequently asked, should radical operation be performed after the border-line cancer has been arrested by radium. The practice of some surgeons has been to operate when all evidence of local necrosis and fixation have disappeared, but the results reported are not generally satisfactory. Our limited experience does not justify making a definite statement, but many are of the opinion that, if a clinical cure is obtained, no great advantage is to be had by subjecting the patient to a subsequent severe and questionable operation. Some observers state that, if recurrence develops after radium, it will manifest itself within the first year. Bumm, however, has found several recurrences after two and three years. One illustrative case of our own may be cited. A patient, age 36, with cancer of the anterior lip of the cervix had an apparent involvement of the bladder wall. The application of fifty mg. radium for forty-eight hours, resulted in an apparent cure. Examination every two months showed no recurrence. After twenty months there was evidence of a small hard nodule not unlike a very small fibroid in the anterior vaginal wall. This was excised for examination and proved to be a degenerated carcinoma with much broken-down tissue. Within three weeks there was a rapid recurrence and it could not be arrested by successive doses of radium. It is our belief that such recurrence should not be operated, as trauma seems to excite the dormant cancer cells. In clearly operative cases, however, where radium is used as a preoperative precaution, we believe panhysterectomy should be done within ten to twenty days. It has been our observation that small, rather than massive, doses should be employed when used as a preoperative procedure, as large doses produce dense scar tissue and render radical operation difficult. A safe rule is to employ 2400 milligram hours radium element which does not, as a rule, produce heavy scar tissue.

CONCLUSIONS

Cancer of the cervix is still to be classed as an operative condition when discovered early and the patient is a good risk. When a doubtful border-line condition is presented, treatment by radium is advisable and the question of subsequent operation should be determined by the reaction obtained; but if operation is contraindicated by age, general condition, heart, kidney, or blood vessels, radium alone should be used.

A careful comparison between the cautery and radium type of treatment shows that both have advantages and disadvantages and that, in carefully selected border-line cases, far better results are obtained by a judicious combination of cautery amputation followed by moderate doses of radium.

Our results in this small series of border-line cases, while generally satisfactory, are far from conclusive. We have presented our changing views on the subject with the hope that other members of the society will tabulate their results, in order that the less experienced surgeons may formulate some definite plan of procedure in dealing with a diseased condition which heretofore has presented much difficulty. The wide range of radium dosage in treating cervical cancer, varying from 1500 mg. hours in some clinics to 8000 mg. hours in others, shows that no definite conclusions have been reached; and while favorable reports have been received from both extremes, the use of radium will be somewhat empirical. Definite conclusions can be drawn only after a careful tabulation of a long series of cases based on follow-up and end-results.

DISCUSSION

DR. JOSEPH H. BRANHAM, BALTIMORE, MARYLAND.—The results of treatment of cancer by radium in Dr. Kelly's hospital have been bad in most cases. I want to mention a case that I thought would be of interest and feel that it might be added to those reported. I have used the cautery in separating the cervix from the vagina, and sometimes higher up, in most cases of cancer for several years, completing the operation from above or below in the ordinary way. A little over four years ago I operated on a case that had a well marked epithelial cancer of the cervix that was advanced to a considerable degree. I did the operation in the way I mentioned, but found infiltration extended well up into the right broad ligament a considerable distance from the uterus. I removed the uterus as well as I could, then applied to the tissue the low heat cautery. I told the husband the case was perfectly hopeless, and that she would die in a short time. She is living after four years. This case shows that a low degree of heat is a good thing in these cases.

DR. G. VAN AMBER BROWN, DETROIT, MICHIGAN.—It has been pretty well shown, I think, how much penetration we get with radium, also with the x-ray, and a comparative study of the two is quite interesting. The effects on the tissues of the gamma rays of the radium and the hard rays of the x-ray are the same except in intensity. The attempt has been successful to administer a lethal dose to malignancy with radium at a distance over 6 cm. from the point of application. With the x-ray, on the other hand, 10 cm. below the skin surface may be successfully heated by the so-called cross firing. Bearing in mind the colorature of the skin with an erythema dose of radium, only 25 per cent of the skin dose will reach 2 cm. below the surface, whereas 86 per cent of the roentgen ray will reach 2 cm. below. At 10 cm. below the surface the effect of radium would be only 2.8 per cent of the skin dose, whereas the x-ray effect would be 51 per cent of the skin dose or the x-ray would be eighteen times as efficient as radium at a depth of 10 cm. To my mind this means that in some places one can use radium where for mechanical reasons it is inconvenient to use the x-ray. In cavities such as the

throat, bladder, cervix, and vagina you can place radium so as to get the full effect, whereas with the x-ray it cannot be placed close enough to the part. So that for cavity work it would seem that radium is indicated; but for surface the x-ray. To check metastasis there is no agent which will replace the x-ray because with it we can reach all possible areas of metastasis.

I may have misunderstood Dr. Weiss but I think he spoke of the Percy cautery. We should not refer to it as a cautery but as the Percy heat. Percy has shown to his own satisfaction, at least, that cancer cells exposed to a temperature of 113°F. for ten minutes time are destroyed. So it is a low heat that is used and not a cautery. One stops short of carbonization of the tissues. If you carbonize the tissues the purpose of the operation is defeated, first, by getting as Percy says, the carbon core, which acts as a plug and impedes drainage and a toxemia is the result. The patient dies from this, and not from the cancer. Carbon is a nonconductor of heat, so in the presence of a carbon core, heat is not disseminated. Only sufficient heat should be used to produce sealing of the lymphatics, also, at the same time, cut down the blood supply.

DR. JAMES N. WEST, NEW YORK CITY.—Recently I was preparing a paper on this subject because I thought I had a case of carcinoma of the cervix that had been cured, and that was the only one, and I have been operating for many years and have seen a good many cases of carcinoma of the cervix. The one case I thought I had cured because the patient had gone seven years without apparent recurrence. While I was writing this paper I got a telephone message to make an appointment for an examination of this patient, and found her pelvis, to my great disappointment, filled with carcinoma. This was six or seven years after the operation. She had had a hysterectomy done and follow-up x-ray treatment. I have used the Percy cautery, but not the Percy cautery operation, in combination with x-ray, and my experience has been in line with the last speaker, that the x-ray has more influence in retarding the growth of cancer of the uterus and giving a period of apparent cure than radium. I have made a fair trial of radium therapy, but the results have not been at all satisfactory.

One of the most brilliant results I have had in palliative treatment of carcinoma of the cervix has occurred within the last two years.

A year ago last April a patient with inoperable carcinoma of the cervix appeared at my office. I treated her by the Percy cautery, not by the operation of Percy, using the cautery extensively and for about fifty minutes, with the hand in the abdomen to control the amount of heat applied. This patient appears now to be cured. In addition to the Percy cautery she had the x-ray applied. The woman had been suffering from hemorrhage and a profuse discharge, and the mass, when I opened the abdomen, showed such attachments that it was impossible to remove it. The uterus has diminished in size, and there is no discharge, and to all intents and purposes the woman is well, yet I feel quite sure that the result is only palliative. This is one of the best cases of palliative treatment I have ever had.

Recently I saw a case of cancer of the urethra treated by radium which had been pronounced cured. When I came from the examination room I told the husband that she was not cured; that she still had carcinoma and it was proceeding along the usual lines. He was disappointed. The next thing I heard was she was having injections of nitrite of potassium, and that now she was cured, and he called upon me to close the urethra. On examining the patient I again told the husband that his wife had advanced adenocarcinoma and would not live very long. Six weeks after that she died. She had been twice "cured" of cancer. Of course, the results, and the comparisons and study the reader of this paper has made are

extremely valuable, and that is the kind of study we want. He does not make any extraordinary claims for radium, x-ray, or the cautery, but he is studying the question to give us the advantage of his experience and his comparisons of the various methods.

DR. ABRAHAM J. RONGY, NEW YORK CITY.—To my mind the greatest difficulty with cancer of the cervix and uterus is to determine what is a border-line case. Two weeks ago a young woman came to my office who has had four children. She is thirty-six years old; she bled irregularly, spotting and staining for about three months. On examination I found the interior of the cervix cancerous, the disease extending into the anterior vaginal wall. I burned out the cervix with the cautery, and then called in one of New York's most prominent radium specialists to see whether radium could be used in this particular case. He came up there with his biologist, and after examining the woman rectovaginally, and after seeing the slide under the microscope, he came to the conclusion that the primary lesion in this particular case was in the anterior vaginal wall, and not in the cervix. He promptly told me that if I could remove the uterus and cervix, he thought he could cure the cancer in the anterior vaginal wall, with the explanation that there was a possibility of a fistula of the bladder developing.

A week ago I operated and what apparently on examination seemed to be a simple case, with no adhesions, the uterus free, I found associated with the most pronounced chain of glands on either side along the ureter. Beginning away up at the upper portion of the broad ligament, I was compelled to dissect along the course of the ureters on either side, taking out the uterus with it, and as much of the anterior vaginal wall as I could at the time. The patient is doing fairly well. Here was a case that was apparently very simple but that case is not going to be cured by radium. While I have removed every possible visible gland or any gland I could feel about the ureters and uterus, still I am sure there must be glands that I did not remove, and there is going to be a recurrence.

My experience with radium in cancer of the cervix has been unsatisfactory. My cases are sent to men who do nothing but radium work. In all the cases I have had so far, where the cautery has been used and panhysterectomy has been performed, there was a recurrence at the end of six or eight or ten months or a year with the exception of one.

I believe that the problem of cancer is not so much in methods of cure as it is in the fact that these women come to us too late. Somehow or other we must educate the public that every woman who finds she is not quite right, particularly after the menopause, if she has increased leucorrheal discharge in the form of staining or spotting, should go to a physician immediately.

DR. JAMES E. DAVIS, DETROIT, MICHIGAN.—The last speaker (Dr. Rongy) has brought out a practical point. Any one who looks over a large number of specimens must be impressed with the fact that very frequently tissues that are removed and are supposed to be normal, or at least but slightly hypertrophied, yet they are found to contain metastasized cancer cells. The first thing that one has to encounter in this problem is the anatomic location of the cancer. This is certainly very difficult, because not always do you have anatomic deformation; not always do you have any hypertrophy, any appreciable change that can be detected by the eye or the tactile sense. So the application of any of these means, without very careful location of the cancer tissues, is very likely to be a failure. The choice of dosage is an important question also. Just what should be the dose, I am not sure that any one at the present time knows, not even

those who are constantly working with the radium, x-ray or the cautery heat method. The problem of application to within therapeutic distances and the penetration are of prime importance.

As to the effect upon the tissues, there is first the direct calorific cytoplasmic change; also the changes in the blood vessels, ordinarily an embolic, and then a thrombotic change. There is also a destruction of lymph vessels, obliteration of lymph vessels, and then we have in addition that change which we are not able to explain, which comes in the interaction of the cells. The cells acted upon by heat are changed cells, and they produce different cell fluids.

DR. WILLIAM SEAMAN BAINBRIDGE, NEW YORK CITY.—I would like to emphasize one or two points and report a case. Too much stress cannot be laid upon the method of examination. Just as a cancerous process can be extended in the breast by manipulation, cancer cells can be passed into the pelvic lymphatics and the case become a hopeless one. This has been proved by Tyzzer and Ordway in experimentation with animals.

The preparation of the patient, it seems to me, is of vital importance and is often overlooked in dealing with advanced cancerous neoplasm. It was my practice for a number of years before the war, and the results have been very gratifying compared with the results of cases treated otherwise, to remember that I had before me a cancer in a patient, rather than a cancer case.

For three days preceding the operation, the patient is given colonic irrigations of bicarbonate of soda—a dram of soda to the pint of water, using eight or ten gallons per day. By thus hydrating the patient with alkaline solution, the acid content of the bowel is diminished and the patient is in better condition to stand operative interference. During and after operation, I use hot saline solution. I pour it into the abdomen when performing the laparotomy, and operate in a practically fluid medium. I have been using hot saline solution in this way for eight or ten years.

Some seemingly irremovable cases of malignant disease have become operable. One patient was sent to me ten years ago with the diagnosis of irremovable, inoperable carcinoma of the uterus, beginning in the cervix. I did the starvation ligature and lymphatic block operation. The patient was prepared as far as possible, for a laparotomy. Both iliac arteries were tied off; the ovaries, uterus, part of the vagina, and all the pelvic glands were removed, including the lymphatic glands from the brim of the pelvis all the way down, plus those in the obturator foramen on both sides.

Three months ago I came in touch with this patient. She is apparently entirely free from cancer, and seems perfectly well, although she was sent to me as a hopeless case.

It will help us, I believe, if we bear in mind another point Dr. Weiss makes. Do not estimate the extent of the disease in the case by the conditions present at the first examination. Much may be inflammatory and mask the true condition. Manipulation will set free a number of cells and thus cause extension of the disease by destroying Nature's barriers. In proportion as there is blood supply there is extension of the growth, and because of this the starvation ligature operation is of real value.

A lowered general vitality, as well as a lowered local vitality, has some relationship to cancer. Inasfar as the essential cause of cancer is concerned, we have not made any more progress than did Hippocrates. It is a complex disease. During the past one hundred and fifty years we have whittled away syphilis, actinomycosis, blastomycosis and tuberculosis, all of which formerly came

under the general term of "cancer," and I do not believe we have yet reached the end of differentiation.

DR. WEST.—In the case which you mentioned, did the cancer involve the body of the uterus or the cervix?

DR. BAINBRIDGE.—The cancer involved the uterus but began in the cervix. The case was sent to me by Dr. E. M. Mosher of Brooklyn. When the first pathologist made the diagnosis I said there must be some mistake, and sent the specimen to three other men; all the reports came back "malignant carcinoma."

DR. WEISS (closing).—I believe with Dr. Brown and Dr. West that the judicious employment of x-ray is a splendid postoperative adjunct. I did not say anything about x-ray treatment because I do not know enough about its practical application, and all such cases for treatment we have referred to competent roentgenologists. Likewise we did not discuss the use of massive doses of radium over the sacrum as a postoperative treatment. It was used in several cases, and in these the results seemed to be better, but it is too early to speak of definite results.

In referring our cases to the roentgenologist, we must be careful in our follow-up if we expect to reach any definite conclusion. My own practice has been to examine the patient with the roentgenologist and so check up our observations. There should be a hearty cooperation between the gynecologist and the roentgenologist in treating carcinoma of the uterus.

As to the amputations we have performed, I may state that we have used the Percy cautery but did not do the Percy operation. My experience with the Percy operation has not been extensive enough to state definite conclusions. I have performed it eight times, and that is too small a series to say anything definite about the method. I regard the Percy operation as a formidable procedure, especially when we consider that those patients are definitely borderline or advanced cases and a severe operation may aggravate matters, or cause a protracted convalescence.

There is one question I wish to put that has no direct relation to the paper. Has any member of the Association present seen carcinoma of the cervix in a complete procidentia of the uterus? I have never seen carcinoma in this condition and am curious to know the experience of the other members. Ordinarily we should expect to find carcinoma a frequent complication of complete procidentia when trauma is constant.

DR. CHARLES L. BONIFIELD, CINCINNATI, OHIO.—One of the worst cases of cancer of the cervix I have ever seen in my practice was met with about two weeks ago in which there was a complete procidentia. The cancer had developed long after the procidentia of the uterus had occurred.

REPORT OF CASES OF POSTOPERATIVE CONVALESCENCE COMPLICATED BY FAULTY FUNCTIONING OF THE DUCTLESS GLANDS

By Charles L. Bonifield, M.D., Cincinnati, Ohio

I QUOTE the following paragraph from my Presidential Address, delivered in 1915:

"One of the improvements to be made in the future of surgery is a more accurate way of estimating the surgical risk in a given case. It is well known that certain individuals withstand operations from which a majority of people would die. Others succumb where the majority would survive. We are able to recognize some of the conditions of the heart, the lungs, and the kidneys that render one a poor surgical risk. A knowledge of the blood pressure is also valuable. But there is still something that eludes our present means of investigation. Because our methods of estimating the risk are still incomplete and imperfect, is no reason for neglecting to use those we have to the best advantage. The surgery that the masses receive is not the surgery of a few selected leaders with special endowment by nature, special training, and special facilities. I think it can be safely said that the average patient, when she consults a surgeon, has her heart and lungs not very carefully listened to by the surgeon himself. Then she is sent to the hospital, and the interne is instructed to examine the urine. This, by some internes, is conscientiously done; by others, I am sure, the examination amounts to little more than looking at the urine. Not infrequently the recognition of some abnormality other than the one for which the operation is to be performed, would lead to its postponement, and suitable preliminary treatment would change the risk from a very poor one to a comparatively good one; and this in turn, would give a lessened mortality rate in the year's work."

Case I.—Mrs. C., age twenty-five, had been married for about two years; had taken training as a nurse before her marriage; came to my office, complaining of discomfort in the pelvis. She had been under the care of a young physician, who had diagnosticated pregnancy. She gave a history of having been in an auto accident five years before, and her pelvis was supposed to have been fractured, and she was said to have some internal injuries. A year later a paralysis of the right leg and arm developed, and persisted for three months. She also gave a history of measles and scarlet fever during childhood; and tonsillitis and rheumatism about the age of ten; her heart action was rapid, but otherwise normal. Pelvis examination showed both appendages inflamed, and bound down by adhesions. She was passing a very large quantity of urine, a condition which had come on very suddenly about a month previous to my seeing her. The urine was examined several times, with the uniform result of finding it to be of low specific gravity, and neither albumin nor sugar present. I therefore, made a diagnosis of diabetes insipidus, and advised an operation for her pelvic condition. She entered the Good

Samaritan Hospital on December 1, 1919. I curetted the uterus, removed the left tube and ovary, amputated the distal third of the right tube with a small portion of the right ovary, and removed the appendix, all under ether anesthesia. The operation lasted forty minutes; she left the table in good condition. The next morning I found her extremely restless, very rapid and weak pulse, and semiconscious. The interne was giving her saline solution, subcutaneously. Her chart showed that she had passed an enormous quantity of urine, and she was evidently quite dehydrated. I ordered that she be given artificial vichy water by the mouth, saline solution by the rectum constantly, and subcutaneously, when absolutely necessary, and that she be given a hypodermic of one c.c. of pituitrin. She responded to this treatment very promptly, and in a few hours the clinical picture had entirely changed. I found that one c.c. of pituitrin, given hypodermically every six hours, controlled both the nervous symptoms, and the output of urine. I tried giving it to her by the mouth, but it had no effect. I therefore kept her constantly under its influence, until she had made a surgical recovery. Then she was placed under the care of Dr. John Greiwe, a skillful internist, who treated her in the hospital with some benefit for a number of weeks. I saw her in June; she was looking well, and said she felt so, but the excessive secretion of urine still persisted.

CASE II.—Mrs. H. C., Williamstown, Ky., was brought to my office by her family physician, Dr. O'Hara. She was 29 years old, married, and had one child, five years of age. After physical examination, I made a diagnosis of chronic appendicitis, retroversion of the uterus, and inflamed tonsils. She entered Good Samaritan Hospital, and on March 19, 1920, I removed her appendix, did a Gilliam operation on the round ligaments, and Dr. Robert Stevenson then proceeded to remove her tonsils. The anesthetic was nitrous oxide, followed by ether. There was some shock following the operation from which she rallied rather slowly. At 6 P.M. her temperature had not yet returned to normal, pulse 82; at 11:30 P.M., her temperature had reached 100°, and her pulse 102; at 3 in the morning her temperature had gone up to 103°, pulse to 144. The patient was exceedingly nervous. At first I was inclined to attribute her temperature and rapid pulse to some absorption from the tonsil operation, but after observing the case for some hours, made a diagnosis of hyperthyroidism. I prescribed one-eighth of a grain of protiodide of mercury every six hours, and 30 grains of bromide of sodium, by rectum, at about the same intervals. On March 22nd, the temperature had dropped to 99°, and pulse to 108, and her nervous symptoms were rapidly subsiding. From that time on she made a speedy recovery, without showing any evidence of infection in the peritoneal cavity, or in the incision.

CASE III.—Miss D. W., of Loveland, Ohio, was brought to me by Dr. Coleman of that town. After a physical examination, I made a diagnosis of chronic inflammation of the gall bladder and appendix. On June 22, I drained the gall bladder, and removed the appendix. She left the table in good condition. At 6 o'clock her temperature was 100°, and pulse 104. The following morning her temperature was 100°, and pulse 124. She was exceedingly restless, but the gall bladder was draining nicely. She was able to void urine, and her abdominal condition was entirely satisfactory. She was given 30 grains of sodium bromide by rectum, and as that did not control the restlessness, one-fourth of a grain of morphine was given hypodermically. The third day her temperature was still 100°, and pulse 168. The morphine and atropine were continued and digitolin was given also to slow the pulse. Her condition was precarious when I left the city for my summer vacation on June 30. After my departure, my associate, Dr. Frank M. Coppock, and Dr. John Greiwe took care of her, continuing treatment along the same lines. For a few days she was absolutely insane, but this suddenly passed away, and she recovered rapidly from that time on. I met her about a week ago. She was looking well, and feeling good.

REPORTS OF FIVE CASES OF TUMORS OF THE PELVIC ORGANS

By G. Van Amber Brown, M.D., Detroit, Mich.

THERE is no field of medicine so depressing as the study of the results obtained in the treatment of cancer; and I offer these reports for whatever value they may possess with the hope that they will, at least, create a free discussion and create new interest. Of the five cases, four are living. The present condition of the four will be given in the individual reports. I particularly wish for a free and frank criticism of the treatment rendered the case of cancer of the cervix. The two cases with solid tumors of the ovary to be reported, remind us, in both the young and the old, that during our clinical study of cases of pelvic tumor not directly connected with the uterus, we should bear in mind the possibility of the pathology shown in the cases.

Case I.—*Papilloma of bladder.* (5269.) Housewife; forty-five years old; entered Providence Hospital November 9, 1919. She was a very large, tall, stout woman, and her general physical condition seemed perfect. She had always been in excellent health, with the exception of the diseases of childhood and, about fifteen years ago, she had a severe attack of pain in the upper abdomen associated with vomiting. These pains settled in the right lower abdomen. She had several attacks, the last about six years ago. Her present trouble seems to have begun ten months ago with frequent bloody urination. There was no pain. Three times the patient noticed small shreads passing with her urine, and a couple of times little pieces obstructed the urethra, coming partially out and then again returning to the bladder.

Cystoscopy revealed a tumor of the bladder the size of a hickory nut appearing as a cluster of grapes, which was located a short distance above the right ureteral meatus. *Diagnosis:* Papilloma (benign.)

Treatment.—The mass was fulgurated, November 9; and during the following 90 days this was repeated four times, or a total of five applications.

Result.—Seven days after the first treatment, cystoscopy revealed the tumor about one-third the original size. Two weeks later came the report by telephone, "no bleeding." April 12, five months after the first treatment, cystoscopy showed that the growth had entirely disappeared, leaving a red scar. July 3, 1920, no scar discernible, bladder perfectly normal.

Case II.—*Advanced Carcinoma Uteri.*—(305.) A housewife; thirty-eight years old; entered Providence Hospital, January 15th, 1920. Family history good. Menstruation began at fourteen years; regular and of 28 day type. Married at eighteen; five children living and well; one miscarriage following fourth child; husband living and well; last baby born eight months ago. For over a year patient has noticed slight bleeding between periods. Flowed twice while carrying her last baby. This occurred about the fifth or sixth month. Flow regular since birth of last child,

except last three weeks some clots were passed. No pain or other disturbances associated with the bleeding. Patient feels well otherwise; no pain in any part of the body; always somewhat constipated; no shortness of breath; no urinary disturbance; no swelling of legs; gained weight in last few years; no weakness until recently; is well developed and weighs 150 pounds; complexion sallow; pupils react to light and distance; mucous membrane pale; tonsils slightly enlarged and show evidence of inflammation; chest negative; abdomen large, loose, and pendulous, with marked increase in fatty tissue; no rigidity or tenderness; no palpable masses in abdomen or pelvis. Vaginal examination reveals a large, rough, hard, bleeding mass growing from the cervix and extending well out into the anterior and posterior vaginal walls. Examination under anesthesia showed that the rectum is infiltrated with the growth as is also the perimetrium. The infiltration is so extensive that the whole appears as if set in masonry. *Diagnosis*: Advanced carcinoma of cervix uteri. *Prognosis*: Hopeless. Tissue was taken by sharp dissection from the cervix for microscopic study. Pathological report, January 22, 1920: The tissue has the consistency of new growth of epithelial structures. Representative sections are taken.

Microscopical Examination.—The entire tissue is extensively infiltrated with rapidly growing neoplastic tissue of squamous celled type in medullary arrangement. The tissue borders are quite densely infiltrated with small round cells. Along the margins there are numerous giant cells. In some places the tissue shows some fatty degeneration and also some red blood cell extravasation. In other places there are aggregations of lymph cells.

Diagnosis.—Extremely active, rapidly growing, medullary, squamous celled carcinoma of the cervix uteri.

February 18th, it was decided to do the Percy operation, since no other form of treatment seemed to offer any hope whatever. Through a median incision we did a bilateral salpingo-oophorectomy, and opened the posterior peritoneum on the right side over the internal iliac artery. Just below the bifurcation was an enlarged and broken down lymphatic gland, which was removed. We then ligated the right internal iliac artery and closed the peritoneal incision. The left internal iliac was then exposed in like manner and ligated. The Percy heating iron was inserted through the cervix to the fundus, held by an assistant, while the operator supported the fundus of the uterus with the gloved hand. Heat was employed for 22 minutes, temperature varying from 130° to 135° F. The abdomen was closed without drainage.

Pathological Report: *Macroscopical Examination.*—The specimen consists of tubes and ovaries. The ovaries show cystic degeneration and corpora lutea. The fallopian tube tissue shows fibrosis in the wall. Sections are taken from the tubes and ovaries. Two sections are also taken from tissue which is undergoing degeneration and which is not an integral part of the ovaries or tubal tissue. *Microscopical examination*: The tubal wall has greatly enlarged blood vessels typifying a passive hyperemia, and there is some infiltration of small round cells in this wall. The folds are undergoing an atrophic change. The ovary exhibits cystic degeneration, increase of blood vessels and degeneration of some graafian follicles. The sections taken from the extrinsic tissue show a far advanced and rapidly growing epitheliomatous process. In this tissue there are many giant cells, much necrotic tissue and numerous cell division forms. *Diagnosis*: Passive congestion and early atrophy of the fallopian tubes, cystic degeneration of the ovaries, and far advanced, rapidly growing carcinoma in the extrinsic tissue.

May 3rd, ten weeks later, examination under anesthesia shows that the indurated area is much lessened. The uterus is freely movable, general condition of patient good. No hemorrhage for six weeks. June 7th, Percy heat applied for forty-five

minutes without anesthesia. August 3rd, examination in the office shows upon digital examination no induration about the vagina or cervix, that the contour of the cervix is good, the tissues smooth and gliding, the uterus very small and senile in type, fundus well forward and mobile. Under the eye the parts look normal in color, except a slight thin scaring of tissue in the vault of the vagina. The woman looks well, has a ruddy complexion, gained in weight, and states that she feels as well as when she was sixteen. Clinically she is apparently cured. August 24th, three weeks later the condition is the same. By sharp dissection a portion of the cervix was removed for microscopic study, this was followed immediately by another application of the Percy heat, which was used for two hours; the last few minutes the temperature was carried gradually to 190°F. All this without anesthesia.

Comment.—It may be interesting to note that, in using the heat without an anesthetic, the patient complained of no pain, there was no hastening of the pulse, no evidence of any shock or distress. On the contrary, the eyes became brighter and the cheeks flushed. When the temperature was carried to 190° F., while there was no pain, she did complain of a slight aching through the abdomen. This, however, amounted to little and soon passed off. She is now about her family duties, feeling well and happy.

A temperature of 190° F. is not recommended, but it was used in this case as a test to see how much heat can be used without producing pain.

A couple of weeks later it was deemed opportune to do the radical operation. This was done September 11, preceded by a cystoscopy; the bladder showed no involvement. The vagina was then painted with tincture of iodine. The abdomen was prepared and opened. We encountered broad extensive adhesions binding the bladder and sigmoid to the uterus, which were freed with much difficulty. The uterus was senile in type. The walls of the blood vessels appeared white, much thickened, and the lumen materially narrowed. It was noticeable that the uterus and the broad ligaments were quite anemic. There was one calcareous gland the size of a lima bean taken from between the folds of the left broad ligament and near the cervix. A hysterectomy was done extending well out into the broad ligaments and including in the dissection the upper portion of the vagina. For the dissection, instead of the knife, the cautery was used. Patient still in hospital and doing nicely.

Pathologist's Report.—Macroscopic Examination.—The uterus is 7 cm. long, 3.5 cm. in its anteroposterior diameter, and 5.5 cm. in its transverse diameter through the fundus. The peripheral surface is irregular, particularly from the level of the internal os down over the cervical portion. Vertical sections exhibit a myometrium with evident increase of connective tissue, particularly noticeable around the blood-vessels, and showing as distinct white areas of greater density than the remaining tissue. In the cervical portion there are some circular arrangements of the tissue elements. These are approximately 5 mm. in diameter. At the internal os there is a scarred area which extends outward towards the periphery. One section is taken from this area, two sections from the previously described area, one through the fundal wall, two from the smaller specimen of tissue and one from the cervix. Seven of these sections were studied microscopically. In a general way, the entire tissue is extensively vascularized. Almost uniformly the walls show thickening, some hyaline change, and some obliteration of the lumen; the obliteration resulting mainly from intimal change. The media, however, is markedly thickened, but not deformed as in the intima. This applies to both veins and arteries. The tissue exhibits marked cellularity. The supporting tissue is hyperchromatic, and in places it appears completely devitalized. The general devitalization change is seen practically throughout all of the tissues. This is characterized by blurring of cell outlines,

cytoplasmic extrusions and cell disassociation. There is considerable hemorrhage and blood extravasation, also round cell infiltration, both diffuse and localized. There are large and numerous areas of carcinomatous infiltration. Most of these areas appear to be distinctly contracting. This is less noticeable, however, in the smaller cell nests. All of the neoplastic tissue presents the general cell picture of degeneration in addition to being quite markedly swollen and blurred. The neoplastic tissue appears to have undergone more degenerative change than the supporting tissue. Histologically there remains an open question as to whether all cancer cells are devitalized.

Diagnosis.—Caloric and atrophic change in carcinomatous and uterine tissue following ligation of blood vessels and repeated application of the cautery.

CASE III.—*Fibrosarcoma mucocellulare carcinomatodes.* (Krukenberg type of tumor). Also an example of Brenner's oophoroma folliculare. (2455.) Mrs. A. F.; fifty-seven years old; entered Providence Hospital May 9, 1920. Her chief complaint was a heavy feeling in the abdomen. The family history was negative. The personal history contains few points of interest connected with the pathology under discussion. The menstrual and marital record shows five children living and well, and three miscarriages. The menopause was passed nine years ago. Oral sepsis and an attack of influenza in 1920.

The patient's abdomen began to enlarge gradually the year before, but did not cause discomfort until about one month ago, when a heavy feeling in the pelvis with frequent urination appeared. There has been a loss of weight, strength, and appetite recently; also abdominal pain after exertion, and frequent urination.

Preoperative Diagnosis.—Ovarian cyst. Findings at operation: A large amount of free fluid in the peritoneal cavity; two degenerating tumors, regarded as fibroids, each equalling a grapefruit in size and attached to the right and left tubes at the uterine cornu. The left was readily lifted out of the abdomen without freeing attachments. The right had a broader, but shorter pedicle. After removal of the tumors the uterus was fixed to the anterior abdominal wall. Before closing the incision, the abdomen was explored thoroughly. Further findings were negative. At this writing patient is in good health.

Pathologist's Report.—Macroscopical Examination.—Two tumors from the right and left uterine adnexa. The specimen is in two masses and is multinodulated. One mass is attached to tissue that resembles the parovarium, and at one end of this tissue there is a structure that resembles the distal end of the oviduct; from this, one section is taken and one also from the tissue resembling parovarian structure. The cut surface of the mass shows a pillar-like arrangement of structure with definite encapsulation. In places there is the so-called red fibroid type of degeneration taking place. There are also areas showing liquefaction change. One section is taken from the peripheral border, one from an area showing liquefaction change and another from the border where there is multiple nodular arrangement. The second mass shows marked discoloration through the capsule and one plane shows multiple areas of hemorrhage. One section is taken from the capsule of this mass. This does not show the pillar arrangement, but is a radiating structure from a central scar.

Microscopical Examination.—The section of Fallopian tube shows marked old atrophic deformity of the plicæ, mucoid degeneration in the wall with focal areas of chronic infection, also areas of calcification and some areas exhibiting new blood vessel formation. The epithelial cells in some of the plicæ show hydropic change and also hyperplasia. One section of ovary exhibits a peculiar multiplicity of graafian follicles. The follicles show both hyperplasia and hyaline change of epithelium. Some show marked cystic outlines. Within many of the follicles are

masses of more or less hyalinized blood. The epithelium in many places shows separation from the stroma. The stroma is a loose reticulum in which are many new shepherd crook form of cells. In certain areas there is extravasation of blood involving both the stroma and the follicles. In some zones there is marked infiltration of eosinophiles and pus cells. In the tunica there are small foci of pus cells, considerable red blood cell extravasation, and some unusual dilatation of the small blood vessels. Another section exhibits the multiple follicles in an older stroma which is a modified, endemic-like, ovarian pattern. The majority of the follicles in this section are filled with hyaline blood material which stains brilliantly with eosin. The surrounding stromal tissue is undergoing necrotic change. In another section the above condition is repeated. Through part of the section the connective tissue shows perversion changes with cell division. In another section there is clearly-defined new growth with a rather sharp line of demarcation in which there are outlines of the follicles, all of which are filled with perverted epithelial cells showing basophilic and eosinophilic staining reactions. These cells, however, are not strictly confined, but are in places infiltrating the stroma.

Diagnosis.—Fibrosarcoma mucocellulare carcinomatodes (Krukenberg type of tumor).

CASE IV.—*Chorionepithelioma malignum with multiple fibroid tumors in uterine tissue.* (3109.) Housewife; thirty-five years old; entered Providence Hospital complaining chiefly of a lump in the abdomen. Her father died of locomotor ataxia; one sister had cancer of breast; one uncle had tuberculosis. Patient has had measles, mumps, chicken-pox, scarlatina, rheumatism, and tonsillitis. Married nine years; no children. Menstrual record is negative, except that one period was missed in November, 1915, and one in May, 1920. In September, 1919, a lump was observed in the right lower abdomen; there was no pain but occasional weakness. For one month there has been nausea; the last menstrual period has been suppressed.

Physical Examination.—Two masses are palpable in the lower abdomen. *Clinical Diagnosis.*—Multiple fibroid tumors of the uterus. Operation. Good recovery.

Pathological Report.—Macroscopical Examination.—The specimen is a multiple fibroid tumor of the uterus; subserous, interstitial and submucous in position. In one area there is degeneration and probable proliferation. Numerous sections are taken from the area. Nearly all of the fibroid areas are well preserved. *Microscopical Examination*: The tissue shows chorionic villi with hyalinized epithelium and degenerated mesothelium, also areas of infection. The epithelium exhibits its syncytial and Langhan's layers. At different places there are infiltrations of mononuclear cells, also new blood vessel formation. The entire structure shows degenerative changes resulting from deprivation of blood supply.

Diagnosis.—Chorionepithelioma malignum with multiple fibroid tumors in uterine tissue.

CASE V.—*Lymphoblastoma (lymphosarcoma), primary in the ovary or parovarium of a child five years of age.* (2935.) Girl, aged five; entered Providence Hospital June 1, 1920, complaining of pain on left side of the hip, and distress in the abdomen. Her family history was negative except that her mother lost two children by miscarriage, each at 3½ months, and had had some kind of kidney trouble. Child had two attacks of measles. About two months ago she complained of headache and earache, both of which responded favorably to treatment. She was always constipated; catharties were given almost daily and at 2½ years she, probably, had a urethral infection. Present illness began about the eighteenth of February, 1920, with bilateral abdominal pain of a dull character and lasting about one week. Since May 28, urine has been passed only in small amounts, from a few drops to a

teaspoonful at a time. Temperature, 100° F.; pulse, 130; respiration, 32; patient is pale, of blond complexion, lies quietly, and is, apparently, without pain. She does not lie straight, and her head is turned to one side. Peripheral circulation is poor. Eyelids are swollen, conjunctiva is reddened, and nose pinched. Tonsils are large; pulmonary edema; heart action rapid; abdomen large, distended; skin glossy, umbilicus protrudes. Percussion dullness from fifth intercostal space to 3 cm. below costal margin. Absolute dullness is diffused over a large part of the lower abdomen. Palpation reveals a large nodular mass which is not freely movable. On right groin enlarged lymphatic gland the size of an almond. Von Pirquet negative. Extremities slightly edematous. Laboratory tests: urine contains pus. X-ray of urinary and digestive tracts negative. Diagnoses considered: (a) sarcoma; (b) tuberculous peritonitis; (c) hypernephroma.

June 4, 1920, through a low median incision, we removed a growth from the left ovarian region, the right ovary, and one enlarged right inguinal gland. The visceral peritoneum was found thickened and studded with numerous large millet seed sized nodules of whitish color. The parietal peritoneum contained nodules of varying sizes; the largest being 2½ cm. long. A gland in the right inguinal region was 3 cm. long. The omentum was markedly discolored and unusually well developed for a child of five years. It had descended well down into the pelvis to within 4 F. B. of the pubes. The peritoneal cavity contained a large quantity of sero-flocculent opaque fluid. A large multinodular tumor was attached to the left parovarium. The right ovary was six or eight times larger than normal and gave evidence of containing new growth tissue. The uterus and intestine were overdeveloped. The liver contained numerous small rough nodulations. The tumor stump bled profusely and proved difficult to control. Anesthesia: Gas and oxygen. Result: Patient died of shock at the end of 22 hours. Autopsy.

Pathological Report.—Macroscopical Examination.—The specimen consists of a tumor from the left parovarium, right ovary, and right inguinal gland of a patient aged five years. The chief symptoms were abdominal pain, constipation, and night sweats. The duration of the condition was about four months. The ovary is 32 mm. from pole to pole and when sectioned has the appearance of solid tissue throughout and has not the consistency of normal ovary. The cortex and medulla are not demarcated. One longitudinal section is saved representing the entire half of the ovary. The inguinal gland is 25 mm. long. One section is taken through the long diameter from pole to pole. The tumor mass weighs 480 gm., is multinodular and markedly vascular upon the peripheral surface. On the peripheral surface it is studded with small nodular patches which are from 1 to 5 mm. in diameter. These have the appearance of organized seropurulent exudate. The side showing the attachment has a surface about 3 cm. in length. One section is taken from the surface bearing the small nodules, and three sections are taken from the area of attachment.

The sectioned mass shows a surface which is pale pink in color and the resistance to the edge of the knife is that of normal fat. The surface of the mass is constructed of multiple irregular, oval or globular units from one and one half to four cm. in diameter, giving the appearance of a composite adenomatous growth. Some of the peripheral nodules show degenerative changes characterized by small areas inclosed within narrow, irregular, white fibrous-like borders. One section is taken from the peripheral nodule undergoing degeneration, and one from the center of the entire tumor mass.

Microscopical Examination.—The section of the ovarian tissue shows the typical ovarian structure of a young ovary. The only pathological change is simple hypertrophy. The remaining structures in all of the seven sections examined exhibit a

new growth infiltrating ovarian and parovarian structures. The ovarian tissue involved by the new growth presents structural characteristics of an adult ovary. The infiltrated structure is composed of lymphocytic cells of perverted morphology. The cells tend towards oval shape rather than globular and all of these cells are hyperchromatic and many are multinucleated, but they are not giant cells. There is marked vascularity excepting where necrotic changes are taking place. In this part of the tissue the older blood vessels are destroyed and many new ones have formed in the marginal portions of the growth. The tissue structure is a mimicry of a lymph gland; there being a difference in vascularity and stroma, both of the latter being increased in the new structure.

Diagnosis.—Lymphoblastoma, primary in the ovary and parovarium of a child of five years of age.

SOME FACTORS THAT DETERMINE TISSUE RESISTANCE TO CANCER

By James E. Davis, M.D., Detroit, Mich.

COMPLEXITY of organization imposes biologic deprecatory limitations of resistance upon individual cells for purposes of aggregate efficiency. The highest plants easily reproduce all their organs, leaves and branches, as well as roots; but the vertebrate is incapable

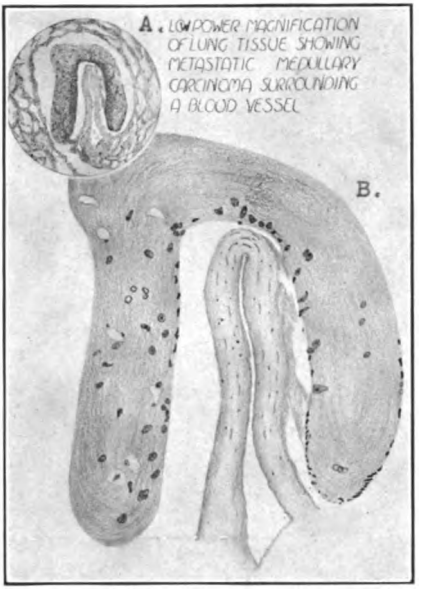

Fig. 1.

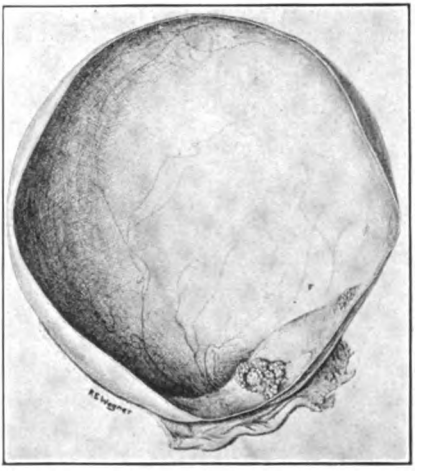

Fig. 2.

Fig. 1.—Illustrative of cell anaplasia and tumor metastasis.

B. Diagrammatic representation of same cancer area showing: Long narrow nuclei and round cell infiltration of blood vessel. Variation in size and shape of cancer cells and their nuclei. Some cancer cells have long diameters perpendicular to vessel as if attacking it. Nuclear material abundant in some and scarce in others, areas of fatty infiltration, etc.

Figs. 1-6 all show significant factors of high tissue resistance.

Figs. 7, 8, 9, illustrate severe malignancy and low resistance of normal structures.

Fig. 2.—Ovarian cyst with early epithelial new growth upon the inner surface of the cyst wall. This is an early proliferation carrying high malignant potentialities.

of reproducing a single complete organ. This is a provision that gives the plant a form of resistance possessing certain advantages in neoplasia. The vertebrate, however, is better organized against mass invasion though at a disadvantage in combating tissue new growths.

The life of a complex organism is the result of cell interactions and the internal metabolism of the individual cells. Factors altering cell interactions are tolerated by the higher vertebrate forms only when it is possible to accomplish conformation within a limited period of time.

Convincing examples of this fact are observed after amputations, resections, traumatizations, auto- and homeotransplants and heteroplastic grafts. Loeb[1] transplanted thyroid into subcutaneous tissue, removed it seven days later and found the transplant surrounded by a connective tissue capsule rich in fibroblasts. Inside the capsule a large vessel was proliferating. In the capsule and about the vessel a few thyroid acini in contracted form were persisting. Necrosis, hemorrhage and organization were going on elsewhere conforming the transplant.

The transplantation of tumors in the higher species of animals has failed, except that of infectious sarcoma in the dog. In normal tissues, resistance is adequate for control and destruction of inherent neoplastic dynamic growth power. This power is uncontrollable in autogenetically prepared tissue lying close to the neoplasm.

Fig. 3.

Fig. 4.

Fig. 3.—Early squamous cell carcinoma. Illustrative of growth below the basement membrane. Early fibrosis and small round cell infiltration of the stroma.

Fig. 4.—Epithelioma upon the cutaneous surface. The growth at the left of the section is very slow and shallow in depth and the surrounding hair follicles and sebaceous glands exhibit marked hypertrophy. The connective tissue is aged. Illustrative of slow growth, low grade malignancy and high resistance in the local tissues.

The cell and its surrounding fluid possess inter- and retroactive properties. The most convincing proof of this is given by Carrel,[2] who has grown connective tissue in vitro for almost eight years. The plasmatic jelly medium, when used too long, became liquefied, its fibrin disappeared and all the air rarefied, effecting a marked slowing of growth. Fresh, unused plasma from the ice box promptly quickened the growth rate. The plasma from a chicken four to five months old caused a growth fifteen microns more extensive than did that from a five to six year old.

The reactions following exhaustion, irritation and specific diet, give acidity, toxicity, and cytoplasmic sensitization. Measurement of these states is a procedure of real scientific value to the clinician.

The reaction of connective tissue to epithelial neoplasia, before and after its invasion, is significant and important. The increased cellularity, invasive and extensive growth, hypernutrition, diminished elas-

Fig. 5.

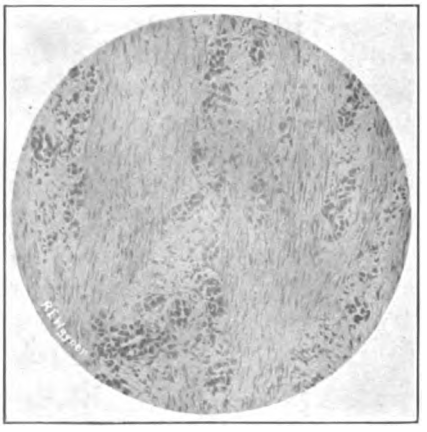

Fig. 6.

Fig. 5.—Basal-celled carcinoma. The new growth tissue is irregular in form and sharply demarcated. The growth is very slow and the connective tissue resistance is high, controlling rapid extension.

Fig. 6.—Scirrhous carcinoma of the stomach. Twenty years ago the patient developed carcinoma of the mammary gland and submitted to a radical operation. Ten years later panhysterectomy became necessary for carcinoma of the uterus. Ten years after this, symptoms of carcinoma of the stomach appeared. No operation was done for this condition. At autopsy neoplasia of the stomach, with marked extensive induration, was found.

The photomicrograph exhibits an interesting involvement of the stomach muscularis, with atrophy, hyalinization, connective tissue increase and new growth epithelial cell infiltration.

Illustrative of carcinomatous involvement, firstly in decidual organs particularly disposed to trauma and infection; secondly in tissue of lowest resistance in the gastrointestinal tract; thirdly, unusual general tissue resistance; fourthly, low degree of tumor cell anaplasia.

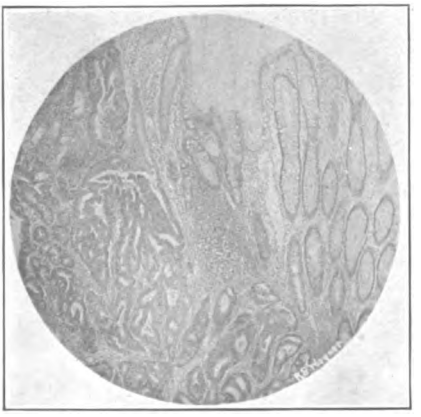

Fig. 7.—Adenocarcinoma of the rectum. The right upper part of the section exhibits catarrhal and resistance changes. The lower left half has new growth glands with excessive production of epithelium. Illustrative of poor differentiation, atypical glands and perverted epithelium.

ticity, changed chemistry, cicatrization, induration and fixation are to be regarded as expressions of a defense mechanism, instigated by cell enzymes or other products. Epithelial cell disintegration stimulates phagocytic and proliferative connective tissue reaction and the

latter in turn may probably cause increase of dynamic growth power, without a corresponding increase of nutrition.

The sharp contrast and the physical integrity in relative positions of epithelium and connective tissues should be maintained for normality of resistance. A militaristic vertical polarity of the epithelial cells upon their basement membrane, with maintenance of their average size, form, staining reaction, nuclear division forms, and protoplasmic cohesiveness are important criteria used in judging the normality of the epithelial tissue. There must also be growth impulse conforming to the established functional equilibrium of body economy.

Gifford[3] says "the intrinsic processes have five basic properties of growth, development, reproduction, nutrition and immunity." All pathologic changes connected with these processes are conveniently studied in two groups: inflammation and neoplasia. But why two? The essentials are similar, the etiology of traumatic irritation, para-

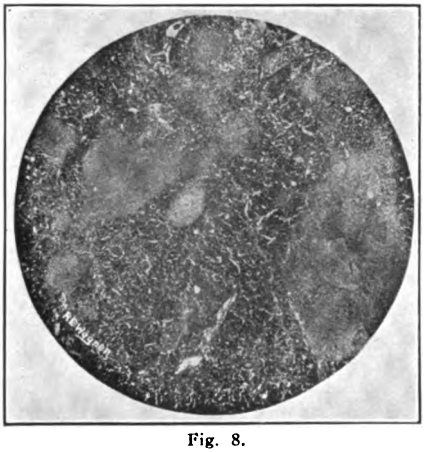

Fig. 8.

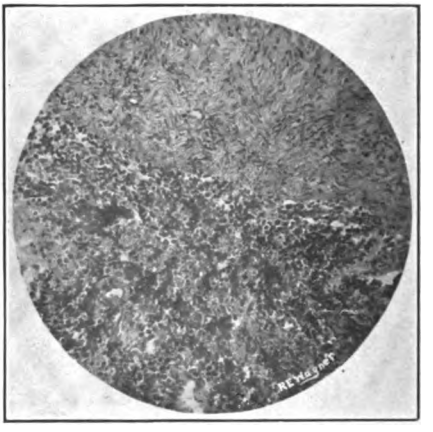

Fig. 9.

Figs. 8 and 9.—Lymphoblastoma (a malignant solid tumor of the ovary weighing 480 gms.) from a patient five years of age with a history of three communicable infections. Her mother had two miscarriages at three and one-half months and also some kidney pathology. The tumor symptomatology has extended over a brief period of but five months and metastasis had already become established. Advanced ageing of contiguous tissues has taken place. The cell structure is lymphoblastic in type, blood vessel wall stroma is abundant but maintenance of a blood circuit has failed to keep pace with the rapid tumor cell growth. The lighter hazy area represents degenerative changes from loss of nutrition. Illustrative of hereditary stigmata; diminished resistance from infections; intensive malignancy.

sitic invasion, or other factors, differ only in their time exposure. With adequate severity of irritant and sufficient periodicity of exposure, there is production of tissue unbalance, lawlessness and dynamic cell growth, a process which terminates only by supreme body unit antagonism, cessation of its nutritional supply, or body death. The clinical recognition of long continued cell irritation and unbalance of tissue is too frequently delayed until after the expression of organic functional disorder. The determination of stressed or irritated tissue potentiality should have much attention. The determination of sensitization, acidity and oxidation reactions are essentially quantitative

tests which have relational value in this problem. It is mainly a quantitative difference in the energy and the irritation time factors that exists between regenerating and cancerous cells, and it is this difference we should carefully estimate.

Physiologic growth, regeneration, and neoplasia utilize the same means to produce a product, and resistance is an essential cause for all three. Normal growth is production under control, regeneration is production to control, and neoplasia is production without control.

REFERENCES

[1]Loeb, L.: Jour. Cancer Research, July, 1920, v, 261. [2]Carrel, A.: Jour. Exper. Med., xx, No. 1, p. 1-2. [3]Gifford: Brit. Med. Jour., Dec. 27, 1913, ii.

DISCUSSION ON THE PAPERS OF DRS. BROWN AND DAVIS

DR. OTTO H. SCHWARZ, ST. LOUIS, MISSOURI.—I would like to ask Dr. Davis whether he has made any observations about the elastic tissue content of the various tissues in malignant disease. It is well known, as has been shown particularly by Taussig, of St. Louis, that in cases of kraurosis vulvæ a marked change takes place, not only in the squamous epithelium, but also in the underlying connective tissue. The elastic tissue here is markedly diminished. In the very marked cases it is entirely absent and the tissue has a hyaline appearance. It is well known also that upon this type of lesion carcinoma of the vulva frequently develops. I would like to ask Dr. Davis whether he has observed that change anywhere else.

DR. WILLIAM SEAMAN BAINBRIDGE, NEW YORK CITY.—I would like to ask Dr. Davis some questions.

1. Has he found any leads, other than those he has given, for a spontaneous cure of cancer? It is a recognized fact in cancer research work that a certain percentage of mice afflicted with cancer, are spontaneously cured of the disease. Has anything been determined along the line of reaction of tissue which would explain such a phenomenon in animals?

2. It has been asserted by certain operators, and in some centers of medical thought, that glands are obstruction stations to the extension of cancer. This seems quite revolutionary. Only the other day, at a national body, a paper was read which indicated clearly this belief. I heard the paper which contained the statement that the removal of glands not yet affected by the cancer *per se*, but in a state of inflammatory reaction, in juxtaposition or within close association to the cancerous growth, meant the doing away with some of Nature's barriers. I would like to ask Dr. Davis if he has any settled conviction in this matter.

3. A member of the faculty at Edinburgh claims that in proportion as there is acidosis in cancerous tissue there is rapidity of extension of growth. Is there anything to support such an opinion?

DR. DAVIS (closing).—The change in the elastic tissue is always very marked, and disappearance of the elastic tissue is, I think, a fact beyond any question.

As to the spontaneous cure of cancer, I know of no explanation for spontaneous cure except it is that balance we have between tissues. As soon as the normal tissues are prevailing over the balance of invading tissue we have a cure. If it is an epithelial growth, we have connective tissue surrounding it that can

overcome that epithelial growth and spontaneous cure results, and with that a shutting off of the blood supply.

As to glands being a means of resistance, I have regarded glands as a definite means of resistance, especially the lymph glands. You may place *in vitro* growing cancer tissue and introduce a bit of splenic or lymphatic gland tissue, and it will kill it off so that the cancer growth will not continue, or if the dose is small enough, you slow down the growth much slower than the usual rate that is being maintained.

As to acidosis, the same principle, I think, can be used in growing the cancer tissue if you add to the alkalinity of the medium to slow the growth, and the same is true in the body unit. There is nearly always acidity produced, and that is why those who advocate a vegetable diet get somewhere with some cases. A vegetable diet will produce a certain degree of alkalinity, and that is why the English school has advocated very strongly the use of a vegetable diet, and with that the addition of an alkali, so that alkalinization has proved of value clinically as well as experimentally.

DR. BAINBRIDGE.—I would like to ask another question. If it be true that a strictly vegetable diet tends to diminish the incidence or cure of cancer, how is it that we find so much cancer in mice. Why do we find so much cancer in many people that are purely vegetarians, as shown by a number of reports, such as the Imperial Cancer Laboratory report, and the reports of the French Academy and of Berlin as well? Also, if that be true, why should we not in the active Eskimo people who live practically on meat diet see cancer more frequently, yet among them we find very little, if any, cancer. In some of the domesticated animals we find more cancer than we find in the strictly wild animals that are meat eaters, whether they be wild or in captivity.

DR. DAVIS.—The answer must be given about in this way: The whole question is one of resistance. The Eskimo must have a degree of resistance that he obtains either from climate or from his diet which has a very high fat proportion for the digestion and metabolism of which he must maintain a high alkalinity of body fluids. He has a different type of resistance. You cannot compare mice with the human though the mice are vegetarians. We may take the case of infection by crown gall. This, according to Smith, is identical with cancer and we find it growing in vegetable material. There the cause is a bacterium or a parasite, but the conditions are different in the vegetable. They are different in animals, and so we have in this complex problem so many factors that there is no way of explaining, except upon general fundamental principles of acquired or developed resistance.

THE PREPARATION OF THE SKIN FOR OPERATION WITH SPECIAL REFERENCE TO THE USE OF PICRIC ACID

By H. W. Hewitt, M.D., Detroit, Mich.

SUCCESS in surgery, as in all walks of life, depends to a large extent upon the observance of details. While the actual technic of a major operation is highly important, only slightly less important are all of the minor essentials entering into that operation. Beginning with the preparation of the patient for operation until the final dressing is applied in the operating room, eternal vigilance is the price of success. If any mistake is made either in asepsis or technic, the operation may be a failure; if the wound does not heal by first intention, not only will the patient be required to spend many needless days in the hospital, but in abdominal operations a hernia may result, necessitating a second operation. It is the purpose of this paper to take up only one of the phases of surgical technic, viz.: the preparation of the skin for operation.

In the early days of surgery the preparation of the skin was accomplished by mechanical cleansing, using soap and water; later, chemical sterilization was added. In the last few years, however, mechanical cleansing has been largely given up, and in its place the much simpler and more efficient method of chemical antisepsis is in vogue. Sterilization of the skin is a relative term only, and will be so used in this paper because it is well known that many germs find their natural habitat in the hair follicles and sweat glands, and cannot be destroyed by any known germicide.

The earlier chemicals employed were carbolic acid, ether, alcohol, the salts of mercury and silver, and many others. In later years, salicylic acid, formaldehyde, betanaphthol, permanganate of potash, oxalic acid, iodine and various solutions have found favor. More recently, malachite green, acriflavine, picric acid and antiseptics of the chlorine group have been used a great deal. Tincture of iodine, or iodine in benzine, has been used perhaps more extensively than any other antiseptic of the past decade. The ideal skin germicide has as yet not been discovered, all have disadvantages; the most efficient, and at the same time the least irritating, is the one that should be employed.

Among other factors entering into this problem, two stand out conspicuously; one is the efficiency of the antiseptic used, the other, the ability of the patient to resist infection. No matter how good the antiseptic may be, if the patient's resisting power is low the wound may break down and infection take place. The writer has, for some time past, been experimenting with different solutions for skin disin-

fection. It seems clear that a good preparation for disinfecting the skin should possess the following properties, viz.: (1) It should be simple, easy of application and efficient. (2) It should have the power of destroying the common skin organisms in a comparatively short time, and it should be sufficiently powerful to keep the skin sterile during the operation. (3) It must not macerate or injure the skin in any way. (4) Used in laparotomies, it must not injure the peritoneal coat of the intestine should this accidentally come in contact with it. (5) It should be of universal application. (6) It should contain no proprietary preparations, since these are of unknown strength and cannot be depended upon. (7) It should be standardized so that its antiseptic value may be known. Solutions may be standardized by the Walker-Rideal method.

Now, of all the methods of skin sterilization and chemicals in use today, very few approach this standard. Bichloride of mercury in aqueous solution will not sterilize the skin; in Harrington's solution it is efficient, but Harrington's solution contains hydrochloric acid and injures the skin to a greater or less extent. The writer has used Harrington's solution extensively and discarded it. Tincture of iodine, or a solution of iodine in benzine, has many disadvantages, viz.: (1) It not infrequently blisters if applied to sensitive skin, such as the scrotum, the vulva, or the axilla; it may injure the skin in other parts of the body so severely as to become entirely useless. (2) A careless assistant, while preparing the patient, may allow a few drops of the iodine to flow around on the patient's back and a blister may form. (3) If the peritoneal coat of the intestine comes in contact with the iodine, or even with the fumes of the iodine, adhesions may form. The writer recently had one such case, in which extensive postoperative adhesions occurred in consequence of this. (4) If iodine is used in less than 4 per cent strength, it does not sterilize the skin, as has been shown in our laboratory experiments. Where iodine is used, it should be carefully neutralized with alcohol before the operation is started. MacDonald's solution has been very popular, but in our hands inefficient. The fault with MacDonald's solution is that it contains pyxol as its chief ingredient. Now pyxol is a proprietary preparation, and is of unknown strength; this in itself is sufficient reason for discarding it. Ether will sterilize the skin, but will not keep it sterile throughout even the shortest operation. Ethyl alcohol is also inefficient. And so on with many other antiseptics.

About three years ago, the writer's attention was attracted to picric acid as used in the British Army. Chemically, picric acid is known as trinitrophenol, its formula is $C_6 H_2 (NO_2) 3OH$, and it is soluble in 95 parts of water and 16 parts of alcohol. It has been used, to a large extent, in the treatment of burns, and is known as a parasiticide. It is also astringent and deeply penetrates the corneous layer of the skin.

Its only disadvantage has been in staining the skin, an effect which will last from 12 to 18 days; but this may be removed by the application of a 5 per cent solution of carbonate of soda, or a 25 per cent solution of ammonia in ethyl alcohol, provided this is done immediately after the operation is finished. The picric acid solution used in these experiments and in our clinic was made by saturating a 70 per cent ethyl alcohol solution with picric acid, which made a 6 per cent solution.

In order that a comparison of the relative values of different antiseptics might be had, an attempt was made to supplement the work of others by additional laboratory experiments, thus to determine: (1) The approximate length of time required to sterilize the skin by the antiseptic used. (2) The approximate length of time the skin would remain sterile after the antiseptic had been applied.

For each experiment three areas of skin were selected, a scraping made from each, and placed in culture media; these were used as controls. Then, one of these skin areas was treated with the antiseptic for one minute, a second area for two minutes, and the third area for three minutes. All were washed with sterile water to remove any excess of antiseptic, scrapings were made and placed in culture media. The media used were 1 per cent glucose agar, 1 per cent glucose bouillon and blood serum. Using fresh skin areas, the tests were repeated five or more times for each antiseptic. The following experiments were tried: (1) Soap and water, scrubbing for fifteen minutes. (2) Ethyl alcohol in various strengths from 50 to 95 per cent. (3) Ether. (4) Tincture iodine 3 per cent. (5) Tincture iodine 7 per cent. (6) Iodine in benzine. (7) MacDonald's solution. (8) Picric acid solution in ethyl alcohol, 6 per cent strength. (9) Ether, three minutes, followed by picric solution, three minutes.

Time will not permit the reading in detail of these experiments, therefore a brief summary will be given. The experiments were repeated five or more times for each antiseptic used, and in each experiment six cultures were taken as follows: Antiseptic applied for one minute, culture taken. Antiseptic applied for two minutes, culture taken. Antiseptic applied for three minutes, culture taken. Sterile gauze applied, culture taken after one-half hour, one and two hours respectively. In general the results were as follows: (1) After scrubbing with soap and water for fifteen minutes, all cultures were positive. (2) Ethyl Alcohol: (a) Applied for one minute, all cultures from epidermal scrapings were positive. (b) Applied for two minutes, all immediate cultures except one were positive. (c) Applied for three minutes, all immediate cultures were negative. Cultures after one-half hour, all positive. Cultures after one hour, all positive. Cultures after two hours, all positive. (3) Ether: (a) Applied one minute, all immediate cultures positive. (b) Applied two minutes, four negative,

one positive. (c) Applied three minutes, all negative. Cultures after one-half hour, all positive. Cultures after one hour, all positive. Cultures after two hours, all positive. (4) Tincture iodine 3 per cent: (a) Applied one minute, all immediate cultures positive. (b) Applied two minutes, all negative. (c) Applied three minutes, all negative. Culture after one-half hour, four positive, one negative. Culture after one hour, all positive. Culture after two hours, all positive. (5) Tinct. iodine 7 per cent: (a) Applied one minute, all immediate cultures positive. (b) Applied two minutes, all negative. (c) Applied three minutes, all negative. Culture after one-half hour, all negative. Culture after one hour, all negative. Culture after two hours, all negative. (6) Iodine in benzine: (a) Applied one minute, immediate culture negative. (b) Applied two minutes, culture negative. (c) Applied three minutes, culture negative. Culture after one-half hour, negative. Culture after one hour, negative. Culture after two hours, negative. (7) MacDonald's solution: All cultures negative. (8) Picric acid in ethyl alcohol 6 per cent solution: (a) Applied one minute, all positive. (b) Applied two minutes, four positive, one negative. (c) Applied three minutes, all negative. Culture taken after one-half hour, where soap and water was first applied, all positive. Culture taken after one-half hour where picric solution was applied to dry skin, all negative. Culture after one hour, three negative, two positive. Culture after two hours, three negative, two positive.

At this stage a change was made as follows: The skin was treated for three minutes with ether, followed for three minutes with picric acid solution, and all cultures were negative, so this technic was adopted in all of the operations here reported. If the patient entered the hospital twelve or more hours prior to operation, the operative field was shaved, scrubbed with soap and water, and a thin sterile dressing applied. In emergency cases the preparation consisted of a dry shave, scrubbing with ether for three minutes, followed by picric acid for three minutes, and the results seemed to be equally good.

The skin in a series of 269 surgical cases was so prepared. These were all major operations, and may be classified as follows: Appendectomy, 92 cases; breast (excision benign tumor), 5 cases; breast (amputation for carcinoma), 8 cases; cesarean section, 5 cases; cholecystectomy, 9 cases; gastroenterostomy, 3 cases; hernia, inguinal, 32 cases; hernia, ventral, 2 cases; hernia, umbilical, 1 case; hysterectomy, abdominal, 29 cases; intestinal obstruction, 3 cases; laparotomy for adhesions, 2 cases; myomectomy, 2 cases; nephrectomy, 1 case; shortening round ligaments, 16 cases; operation on the tubes and ovaries, 21 cases; vaginal plastic operation, 36 cases; a total of 269 cases.

Every wound showing even the slightest discharge was cultured. In all thirty-one cases, twenty-three were found sterile; eight infected. These are as follows: (1) Complete hysterectomy for mul-

tiple fibroids: colon bacillus. (2) Salpingectomy: mixed infection—staphylococcus and colon bacillus. (3) Salpingectomy, bilateral: staphylococcus albus. (4) Appendectomy: staphylococcus albus. (5) Appendectomy: staphylococcus albus. (6) Herniotomy: staphylococcus aureus. (7) Cesarean section: staphylococcus albus. (8) Amputation of breast: staphylococcus albus.

The wounds which discharged and were found sterile upon culture were considered as healing by first intention, as healing took place promptly after the discharge was evacuated. We had then, eight infections in 269 cases, or slightly less than 3 per cent, and we found that these figures compared favorably with those from other clinics.

The merits of this method of preparation are many, viz.: It is simple; cheap; efficient. It does not injure the skin in any way, and may be used on any part of the body; it does not injure the peritoneal coat of the intestine; it contains no proprietary preparation, and its antiseptic strength may be standardized.

This is only a preliminary report. The staff of Grace Hospital, Detroit, have used this preparation, up to August 1, 1920, in 926 cases, and it is now the adopted method of skin preparation in that hospital. The number of cases reported is still too small to justify definite conclusions, but the writer hopes at some future time to report a series sufficiently large to be of clinical value.

DISCUSSION

DR. WILLIAM SEAMAN BAINBRIDGE, NEW YORK CITY.—Since doing work in 1915 with the British Army, I have been using largely 5 per cent picric acid in 75 per cent alcohol and have found it very satisfactory. I have seen no burns from it, and the point of having a dry skin previous to the application of the picric acid seems essential to the best results.

While in the service for the past three years, I have been applying ether when it is obtainable, and alcohol when it is not, upon the skin prior to the use of the acid.

One of the unfortunate drawbacks to the use of picric acid is the color which it leaves. I have tried seventeen solutions, suggested by that number of surgeons, and yet the stain does not come off for a long time. Has Dr. Hewitt found something which will overcome this disadvantage?

DR. DAVID HADDEN.—Have you used lithium benzoate?

DR. BAINBRIDGE.—No, I will try it.

DR. HEWITT (closing).—In regard to the stain, we have found nothing that will take the stain out if the stain has been on an hour or longer. We have tried a great many things. I recall one instance where we did a prostatectomy in which the urine was quite ammoniacal. We noticed the next day the stain had disappeared. Therefore, my assistant began to use a 25 per cent solution of ammonia in alcohol. We have found it will take the stain off if we could apply the ammonia immediately following operation. We have found in these 926 cases operated on by myself and associates that very few have complained of the stain, even the goiter cases. I do not believe it should be used on the face. I believe that this solution has all of the advantages of iodine and none of its disadvantages.

I sent out a questionnaire some time ago, and some of the members of this Association received a copy. Some of the answers were interesting. I shall tabulate these a little later and send the tabulation back to the men who were so kind as to answer the questionnaire. I sent out 100 questionnaires, and of this number I received 68 replies. Sixty-one men used iodine in some form or other, or in some strength or other, but they did not use it on all parts of the body, and many of them preceded it with soap and water. Others used either alcohol, a solution of benzol or betanaphthol. The preparation was very complicated.

I have seen two recent articles in which it is stated that iodine has caused many disagreeable results so that it has been given up entirely. We have been striving to obtain a solution that can be used in our hospital by all operators including eight surgeons and two gynecologists, of whom nine use this solution and like it.

DERMATITIS GANGRENOSA (BULLOUS) IN A NEWBORN INFANT

By Magnus A. Tate, M.D., Cincinnati, O.

THE following very brief case report, with drawings of infant S., is of interest for the following reasons: Diagnosis, extent of involvement, rapidity of gangrenous spreading, and rarity of the case.

Maternal History.—Mrs. S., primipara, eighteen years old, entered the obstetrical service of the Cincinnati General Hospital May 27, 1920, and left June 9, 1920. General physical condition, pelvic measurements, and urinalysis normal. Vertex engaged, right occipitoanterior; fetal heart heard in the right lower quadrant. By measurements and history of date of last menstruation pregnancy was computed to be at full term sometime in August. A few pigmented scars on back suggested lues; but

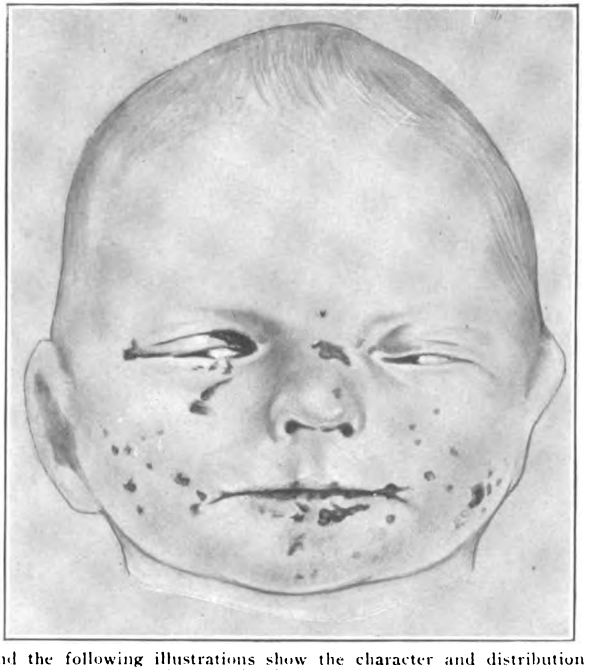

Fig. 1.—This and the following illustrations show the character and distribution of the bullous eruption on the face and extremities.

her personal history was good; she denies venereal disease, and has always enjoyed good health, with the exception of diseases incident to childhood.

Labor pains were strong and effective until the head reached the perineum, when progress was arrested. Forceps were then applied and delivery easily accomplished.

The child was delivered apparently lifeless, but was promptly resuscitated. Male; white; full time; weight, 7 pounds and 4 ounces; length, 50 cm.; cord and genitals normal. General appearance: Numerous bullæ on face and body; entire occiput soft and flabby to touch; mouth and tongue covered with mucous patches; gangrenous

patches on both feet; the large toe on left foot and the second on the right are undeveloped. The gangrene of the feet spread until it reached half-way up the legs, involving the whole of both feet, and on close examination it gave the sharp line appearance as if a cord had been tied around them. On the left hand the first and fourth fingers were gangrenous, and the third finger partially so. The thumb and

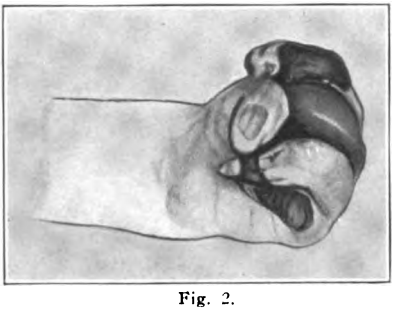

Fig. 2.

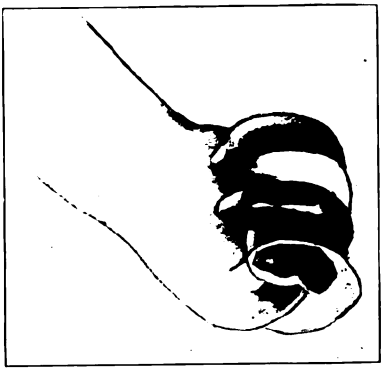

Fig. 3.

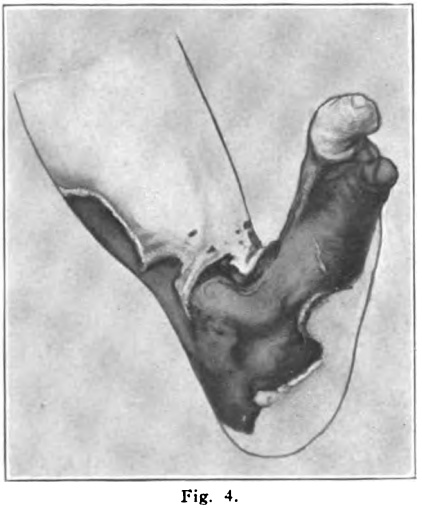

Fig. 4.

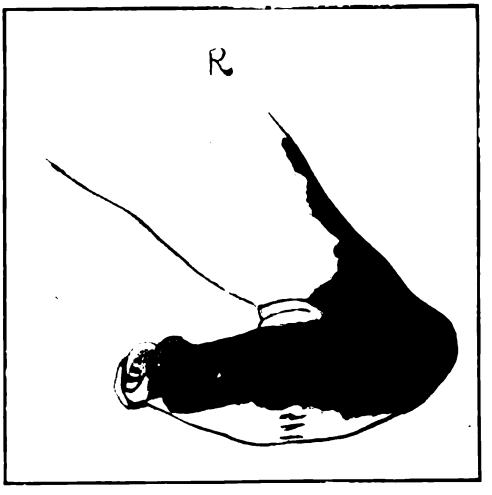

Fig. 5.

first finger of the right hand were partly gangrenous. The child died on the seventh day.

Our dermatologist, Dr. Tauber, gave the following diagnosis: Dermatitis gangrenosa (bullous), probably secondary to a luetic base. Specimens of blood from the mother and from the longitudinal sinus of the infant gave a negative Wassermann.

Mr. J. B. Homan, artist to the Cincinnati General Hospital, kindly made the drawings three days before the child died, and as this condition is so unusual I present it, as I am not cognizant of a like case in literature.

LARGE MESOCOLIC HERNIA SIMULATING CHOLECYSTITIS

By Ingersoll Olmsted, M.D., Hamilton, Ont.

A HERNIA into an abnormal fossa in the abdomen is usually only found at an operation when obstruction has occurred. This obstruction is usually preceded by indefinite abdominal symptoms and a correct diagnosis is seldom made before the abdomen is opened. The necessity of recognizing such a condition when met with is self-evident. Large retroperitoneal herniæ are at times difficult to understand unless an ample abdominal incision be made and the especial anatomical structures exposed. A large hernia in the mesocolic fossa is rare.

Mrs. A. W., age twenty-five years, was referred to me in February, 1915, by Dr. E. T. Snyder of Cayuga, Ontario. She complained of pain in the abdomen on the right side beneath the costal margin. This pain extended through to her back beneath the right shoulder blade. The pain was not always present, at times it was quite distressing and spasmodic. She was also troubled with constipation. She had no vomiting and her appetite was good except during the attacks. She had two children and one miscarriage. Six months before consulting me, she had had an attack of enteric fever. Otherwise her health had been good. The family history was good. The examination at this time showed a slight yellowish tinge of the conjunctivæ, and some tenderness over the region of the gall bladder. The heart, lungs, kidneys, etc., were normal. The abdomen appeared normal in every way except, as above stated, namely, the tenderness over the region of the gall bladder.

Two years later she was referred back to me. She stated that her symptoms had become more pronounced. She complained of pain and distention in the abdomen, especially after meals. The pain extended through to her back from the region of the right costal margin. She was worse after riding over rough roads. Her meals gave her distress, consequently she ate very little and lost weight. She had a great deal of rumbling in her bowels, and the attacks of pain became of daily occurrence. The patient looked thinner than at her previous visit. The conjunctivæ had still a yellowish tint. The physical examination showed heart and lungs normal; urine normal. There was slight tenderness over the region of the gall bladder, but no rigidity of the muscles and no palpable tumor. The uterus was retroverted. The x-ray examination proved negative for the gall bladder, stomach and bowel.

A diagnosis of probable cholecystitis was made and an operation advised. This was done two days later. A short transrectus incision was made exposing the gall bladder, duodenum and antrum of the stomach. These parts appeared perfectly normal. There were no enlarged glands along the course of the bile ducts. The wound was then covered with pads of gauze and a gridiron incision made, exposing the appendix and right ovary. The appendix showed chronic inflammation and was removed. The hand was then passed into the pelvis and both ovaries and uterus palpated. A peculiar bag-like mass was encountered. It was then noted for the first time that there was a scarcity of the small bowel in the pelvis. The round ligament of the uterus on the right side was then shortened, in order to restore the retroverted uterus, and the gridiron incision closed. A pararectus incision was then made in the left side of the abdomen when a large retroperitoneal hernia was disclosed, containing loops of small bowel. To determine the true nature of the condition present, the

original transverse opening in the upper part of the abdomen was enlarged and the transverse colon withdrawn from the abdomen. It was then seen that the upper falciform border of the hernial sack contained the ascending branch of the left colic artery, and was well to the left of the inferior mesenteric vein. The opening of the hernial sack was about four inches wide, and the depth about nine inches, and in the pouch lay at least three-fourths of the small bowel. It could be easily withdrawn, and apparently had been slipping into and out of the sack for a long time. The sac was emptied and obliterated by means of a series of catgut sutures. When the tension was removed from the branch of the colic artery, which lay beneath the free margin of the sac, the artery shortened and became very pronounced. When this free margin was first examined, the pulsation in the vessel could scarcely be felt. A hitch was then taken in the left round ligament of the uterus to help support this organ in its normal position. Both wounds of the abdomen were then closed. The patient made an uninterrupted recovery, and during the last three years has been entirely free of her old symptoms. The drag of the small bowel on the colic artery would account for the pain in the abdomen, constipation and back pains.

UNILATERAL PARTIAL GLANDULAR HERMAPHRODITISM

By Charles W. Moots, M.D., F.A.C.S., Toledo, Ohio

IT has not been so many years since the sex of an individual was determined by the appearance of the external genitalia. Many of us recall the annual pilgrimages to our medical colleges of a certain individual who would, for the privilege of taking up a collection, demonstrate to the class the peculiarities of an hermaphrodite. As we recall our own impressions, it occurs to me that very little, if anything, of value was gained by these demonstrations; in fact, rather are we led to believe that these demonstrations had a tendency to prevent the subject of hermaphroditism from being discussed in scientific meetings. However, as recent events have added greatly to our knowledge of the close relationship between the endocrines and gonads, and of the very close relationship between all of these glands, and the personal characteristics of every individual, I desire to present to this Association the history of a case that has been of exceedingly great interest to myself as well as to several confreres.

Mrs. O. I., aged twenty-seven. Referred to me on Feb. 8, 1916, by a dermatologist on account of uncontrollable hypertrichosis. She is refined and well educated, and the wife of a college professor.

Family history.—Negative as to malignancy and tuberculosis as well as to any particular tendencies to other diseases.

Past history.—Had usual diseases of childhood. First menses at 13; her periods being normal for a number of years. At 19, she became very nervous, lost weight, and was forced to quit college. At the age of 20, she had one very severe uterine hemorrhage following immediately upon a normal menstrual flow; this occurred in Louisville where she had gone to consult a neurologist. Normal menstrual periods were established and continued for eight months, after which time the periods were irregular, decreasing in frequency, and amount of flow. She married in August, 1910, at the age of 21. The menstrual periods grew progressively less frequent and the flow less in amount, until four years previous to this examination it ceased altogether and complete amenorrhea has existed since that time. Following this cessation of the menses, her general health improved and she gained rapidly in weight. However, at the same time, she began to develop the hypertrichosis which has been gradually increasing, the growth of hair now being quite generous in amount over the face, arms, chest, and legs.

Present illness.—Comes on account of the growth of hair on the face, as well as an amenorrhea which has persisted for four years. Has been forced to use depilatories or the razor on the face every second day.

Examination.—Height 5 ft. 7 in. Weight 153 lbs. Blood picture, including the hemoglobin, is normal. Blood pressure normal. Teeth and throat negative. Voice rather deep in tone. Chest and abdomen negative. The clitoris is much enlarged and is one inch in length. The other external genitalia are normal, also the vagina. Uterus is slightly enlarged but normal in position. Right adnexa normal. To the

left of the uterus, a solid mass apparently three inches in diameter can be made out. Otherwise, the pelvis is negative. The distribution of hair over the body is abundant and decidedly of the male type, this being particularly true of that over the face, chest, limbs, and mons veneris; the latter presents the well marked male triangular arrangement with the apex of the hairy triangle at the umbilicus. All nervous reflexes are normal. The thyroid gland was normal in size. X-ray examination shows the thymus to have undergone normal atrophy and the sella turcica normal.

Diagnosis.—At the outset, we felt that we were dealing with a case of endocrine dysfunction and after careful study decided that there was, at least, a relative hyperactivity of the cortex of the suprarenals.

Treatment.—Ovarian and thyroid extracts were immediately started, the thyroid being gradually increased until the patient showed all the well marked symptoms of thyrotoxicosis without exophthalmos. During the month of April, the patient felt that she would surely menstruate but had no "showing" except a profuse leucorrhea lasting four days. Early in May, all treatment was stopped soon after which

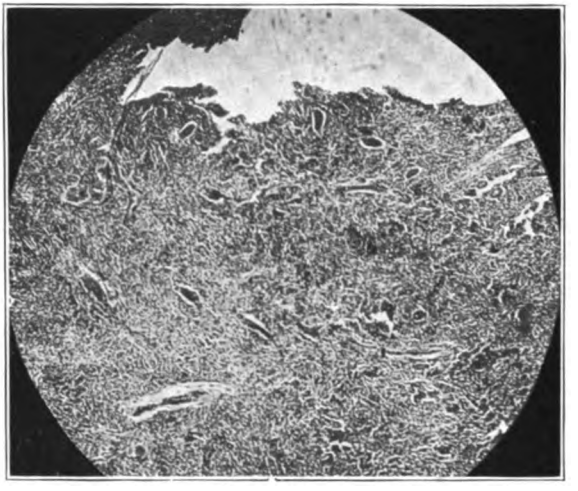

Fig. 1.—Low power, showing numerous tubules.

the patient returned to her usual appearance and feelings. At this time, the patient was examined by Dr. Theodore McGraw, Jr., who not only concurred in the diagnosis but also in our previously taken position that an exploratory operation be done, that the character of the pelvic tumor might be definitely determined. This was not accepted by the patient until Jan. 9, 1917, when, under gas-oxygen anesthesia by Dr. McKesson, abdominal section revealed a solid tumor of left ovary, this being at once removed together with the left tube. Right ovary and tube appeared perfectly normal and were not disturbed. Palpation of suprarenals from the peritoneal cavity revealed no abnormalities. Appendix removed and the abdominal wall closed in layers. Pathologist reported the tumor to be fibrosarcoma.

Subsequent history.—The convalescence was uninterrupted except for a follicular tonsillitis which started just after her return to her home, two and a half weeks following the operation. On the 28th day following the removal of the tumor her menses started and the flow continued at regular intervals throughout the year. Several letters received during the year 1918 while we were engaged in military service, conveyed the happy news that the patient was quite well. Menses normal, and the hair becoming much finer and softer as well as much slower in growth. On Feb.

8, 1919, the husband reported to me that the patient, who had accompanied him to Boston where he was in Army service, contracted influenzal pneumonia and died during the third day of the disease.

Some little time after my return from the service in the Navy, my attention was attracted by a case report in a new publication by Blair Bell of London. His case was strikingly like my own even to the point that his pathologist reported the tumor to be one of malignancy of the ovary. The subsequent history of his case led him to suspect that the tumor might be an ovotestis. After a study of many sections, he was rewarded by absolute proof that his suspicions had become facts, and that the patient had a typical right ovary, while the left gonad was an ovotestis. This evidence together with the interesting history of our own case, caused us to again start an extensive microscopical study of the tumor, which had been preserved, and the following report was recently received from Dr. Ramsey, pathologist to Flower Hospital.

Fibroblastic sarcoma of embryonic testis. Gross description. Growth removed

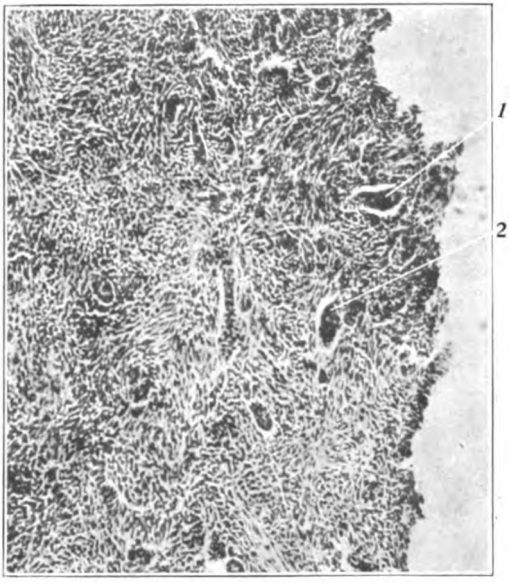

Fig. 2.—Medium magnification, *1* and *2* being examples of tubules.

from region of left ovary. Oval shaped mass about the size of a large orange. Consistency firm—coverings serous and fascial in type. Upon cutting shows fibrous stroma, bundles arranged in whirls and sheaths; presence of ducts and small blood vessels seem to be surrounded and walled by stroma only. Color, pinkish yellow. Several small smooth plaques are found in different parts of the mass situated toward the center and where the fibrous tissue is not discernible. Sections were made from cortex, center of growth, through region surrounding ducts and through several small smooth areas.

Microscopic description. 1. Section through cortex. Fibroblastic spindle cell sarcoma, the cells arranged in bundles and whirls lying closely packed in a very faint fibrillar stroma. A few blood spaces, the walls of which are formed by these sarcoma cells only. Trabeculæ of true fibrous tissue traverse the section, separating the spindle cell bundles. No definite stroma resembling either testicular or ovarian tissue was found in any cortical section. Serous and fibrous tissue coverings not in-

vaded by sarcoma cells; mass seems entirely encapsulated. 2. Section through center of growth and region of ducts. Fibroblastic sarcoma cells separated by fine fibrillar network and arranged in bundles separated by trabeculæ of connective tissue containing lymphatics, blood vessels, and occasionally ducts. Among the sarcoma cells bundles of denser cells with dark staining nuclei form indefinite tubules. Some of these seen on cross section resemble cell masses. These cells are embryonic in type, and no basement membrane can be distinguished. 3. Section through one of the smooth placques. Fibroblastic sarcoma cells lie closely packed and surrounding tubules resembling embryonic testicular gland tubules. These seem almost completely obliterated by the invasion of the sarcoma cells, but, here and there, a definite open tubule is found lined by a single layer of low cuboidal cells, some of these in cross section, others cut longitudinally.

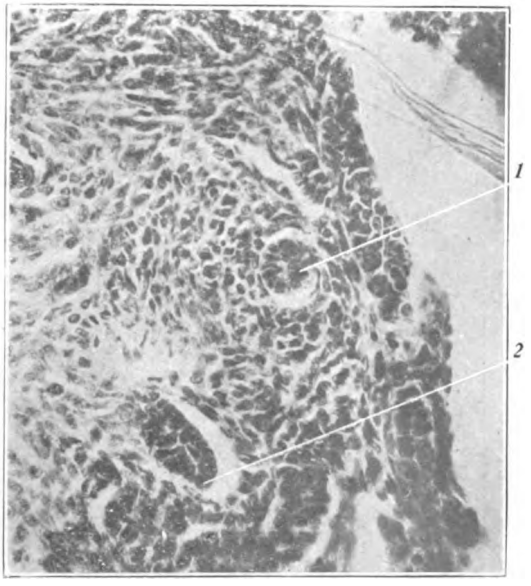

Fig. 3.—High power, *1* and *2* showing tubules.

"*Summary.*—Fibroblastic sarcoma of embryonic testis. The mass may have been an ovotestis with the ovarian stroma completely obliterated by sarcomatous process."

COMMENT

From the clinical history as well as the pathology found, I feel it reasonable to conclude that this patient should be classified as a lateral partial glandular hermaphrodite, having a normal ovary on the right, and a testicle or an ovotestis on the left side, the sarcomatous degeneration preventing a positive determination of the latter propositions. As far as I am able to learn, this is the only case in which surgical procedure was followed by a complete return to the female type, after having taken on such marked male secondary sex characteristics.

DETACHMENT OF ADHERENT PLACENTÆ AND DELIVERY IN ABORTION

By C. E. Ruth, M.D., Des Moines, Iowa

THE great frequency of abortion from whatever cause, together with its possible grave complications, gives the subject sufficient importance to justify its careful consideration.

Complete detachment of the placenta is, at times, difficult; in many cases it is imperfectly accomplished, and in others much needless trauma is done, besides increasing the danger of infection and sterility by the manipulation intended to detach and remove the secundines.

Were the index finger of sufficient length, it would be the ideal instrument with which to produce detachment of the placenta because its tactile sense makes it an ideal instrument of precision, which enables us to practically see and map out the condition. Unfortunately the longest finger is almost, but not quite long enough for the work, as I have abundantly verified in many cases.

Placental forceps now on the market are absolutely worthless for detaching the placenta and any ordinary forceps can remove a placenta which is already detached.

The impossibility of effecting detachment of the placenta by the finger in many cases, the uncertainty and danger of the auger and the curet, even in the most skilled hands has caused a large percentage of the profession to abandon all attempts at removal of the secundines in abortion cases with adherent placenta. These physicians allow the secundines to come away by putrefaction as safer than manipulation of any kind.

Not one physician in one thousand would seriously consider leaving the bedside of a patient for more than a few moments in a case of labor at term, until the placenta was delivered. The placenta has as certainly lost its function in the case of abortion, as in a case of labor at term. If allowed to remain after abortion, this is only an admission on the part of the surgeon that he cannot safely remove it. Failure to remove the placenta following labor at term would by most physicians be considered criminal.

The surgeon should, can, and usually does, prevent infection in wounds elsewhere; he should do equally clean work here and give his patient protection against infection by emptying the uterus at once and thus save her from the dangers of death, prolonged illness, permanently impaired health and sterility. I am convinced that the uterus can always be safely emptied if done promptly, before putrefactive

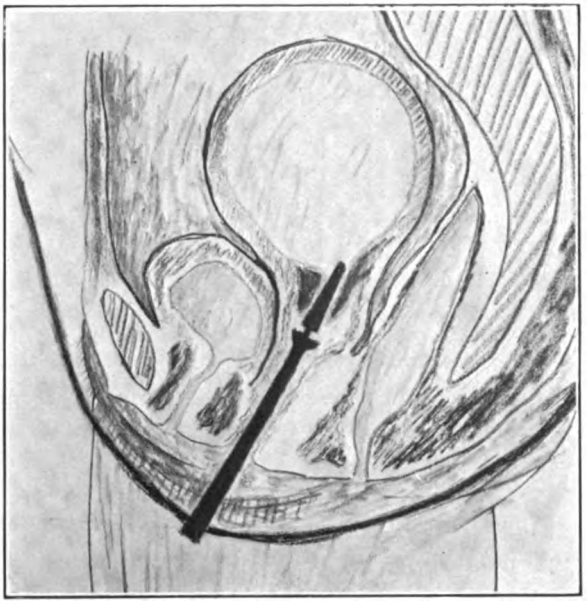

Fig. 1.—Hard rubber dilator on stem, inserted into cervical canal. The elastic bands, necessary to keep constant the small force needed to accomplish dilation with this method, are attached to the lower end of the stem below and to a binder or adhesive around the abdomen, above.

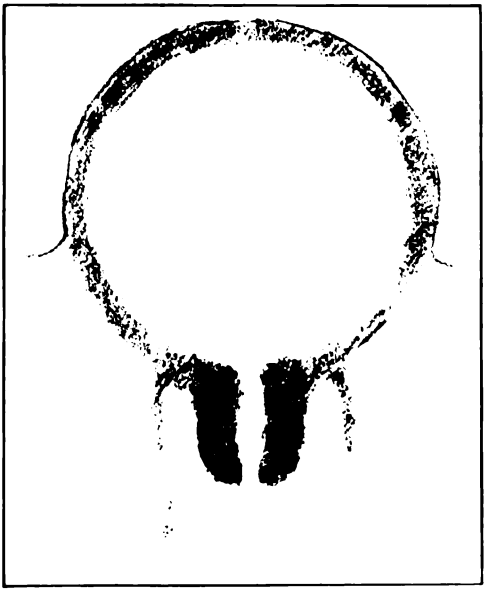

Fig. 2.—Diagrammatic sketch of uterus in early months of pregnancy, showing globular character.

changes have begun, accompanied by pyrexia, septicemia and abscess-formation.

The method presented to you herewith is not an untried procedure, but one I have used for thirty years. I have tested it to my entire satisfaction before asking consideration by the profession.

The body of the uterus in the early months of normal pregnancy, being almost perfectly spherical with the neck of from one to one and one-half inches in length, it follows that any appliance to be of service in detaching an adherent placenta, must be capable of application to

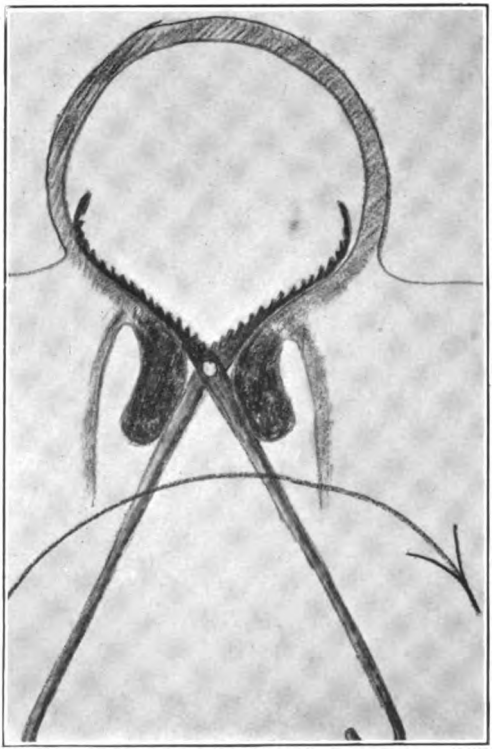

Fig. 3.—Detacher introduced, spread, and ready to sweep the lower segment.

every part of the interior of a spheroid. If such an instrument is to be of the forceps type, it must be capable of being made small enough to be introduced through a long cervical canal; it must be capable of expansion entirely above the narrow cervical canal; must be so constructed as to reach every portion of the interior of the uterus and clear it of detached placental tissues and membranes; and when that is done it should be capable of being closed and withdrawn, bringing with it the placenta and membranes in such a manner that no harm is done to the patient, and with a minimum of pain.

I have devised such an instrument in two sizes, and although I have

used it for many years with satisfaction, I have never until within the last year attempted a published description of its virtues and uses.

The stage of gestation and the size of the uterine cavity, will determine the size of the instrument to be used in detaching the secundines in any individual case.

In some cases, even if abortion is inevitable, the cervix is not sufficiently dilated for instrumentation of the uterine contents. In such instances the use of the hard rubber dilator with elastic pressure will

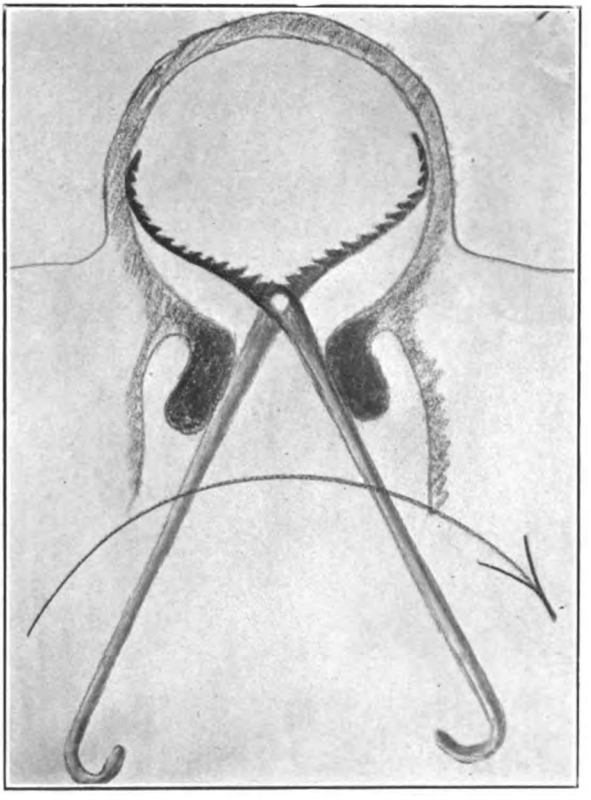

Fig. 4.—Detacher further introduced and sweeping the midportion of the uterine wall.

accomplish the dilation in a few hours, without trauma, without anesthesia, and without abrasion of the mucosa. Then, with or without anesthesia, the detacher is introduced under aseptic precautions with the jaws closed, while the fundus uteri is depressed and the handles of the detacher are carried backward, so as to bring the uterine and vaginal canals in a straight line as nearly as possible. The fundus uteri is steadied by the left hand above the pubes, while the right hand spreads the jaws of the detacher apart and holds them firmly in contact with the lower internal surface of the uterus. In this position the detacher is rotated and the lower segment is swept by a com-

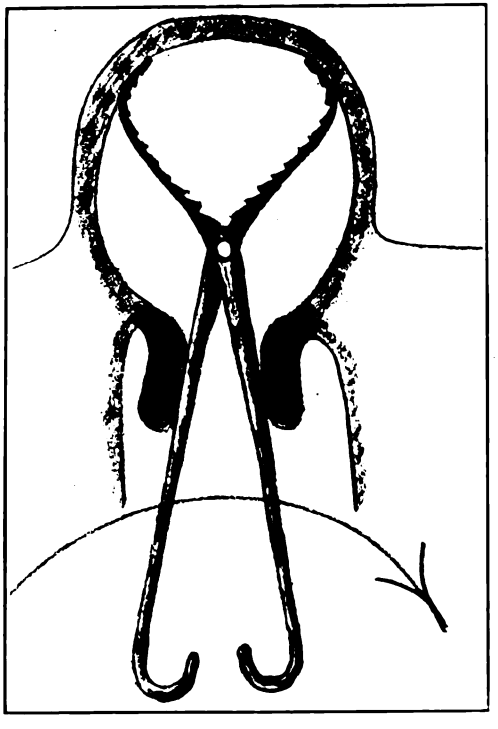

Fig. 5.—Complete introduction of the detacher for sweeping the upper segment.

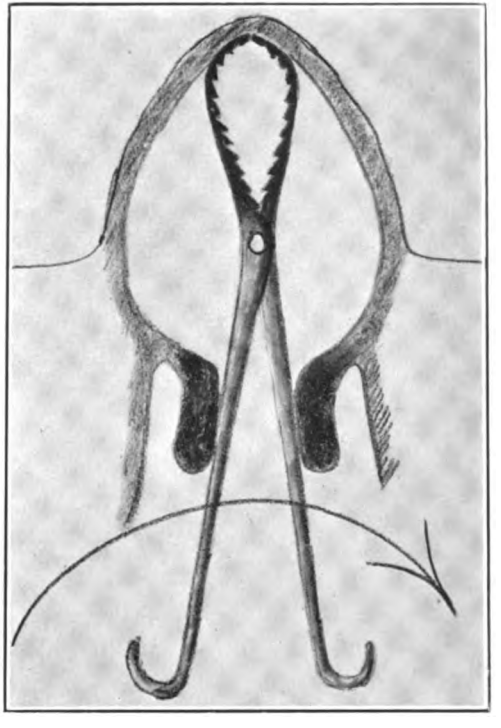

Fig. 6.—Last stage of the rotation completed, placenta and membranes caught in and surrounding the blades. The forceps are closed and ready to be withdrawn.

plete rotation. The detacher is then inserted an inch farther up and again rotated in the same direction; this is repeated until every part of the interior of the uterus has been cleansed. Then the jaws of the instrument are closed and instrument, placenta and secundines are gently withdrawn while the rotation is continued until all is delivered.

Proper care in the use of the instrument will usually result in a complete detachment and delivery of the placenta and membranes at the first trial.

There is however no objection to repeating the performance, if there is any doubt of the complete removal of the uterine contents.

Steadying of the fundus with one hand, while the instrument is rotated, produces very active uterine contractions and materially aids separation of the placenta.

The instrument was originally made to present a dull margin against the uterine wall while rotating to the right. When rotating to the left a sharp edge came in contact with the area from which the placenta and membranes were to be detached.

At the present I would never recommend the use of a sharp-edged or angled instrument in detaching the placenta. Great harm has resulted from the use of the sharp curet in these cases.

I have twice perforated the uterus with a curet and I have seen septic uteri through which the finger could be passed with very slight resistance encountered.

I am convinced that thousands of women have been rendered sterile by the curet with no compensating benefits. The auger principle of detachment is scarcely less dangerous than the curet and its main effect is, principally, to stimulate uterine contraction.

Thorough disinfection should accompany all instrumentation of the uterine cavity and be followed by tubal drainage in all septic cases.

SIGMOIDOUTERINE FISTULA, WITH REPORT OF A CASE

By Walter C. G. Kirchner, M.D., F.A.C.S., St. Louis, Mo.

THE occurrence of a sigmoidouterine fistula is so rare that even a brief account of this condition should prove interesting. In looking up this subject one is struck by the fact that fistulæ of this type are not mentioned in the ordinary text books on surgery, gynecology or obstetrics, and a survey of the literature shows that even intestinouterine fistulæ are of rare occurrence. These fistulæ have been associated with pregnancy and their formation must be considered one of the complications of childbirth.

Intestinouterine fistula has occurred as the result of a cancerous or a tuberculous process, in pelvic abscess, in traumas of, or instrumental perforations of the uterus, and as one of the accidents or sequelæ of childbirth. It is in the latter condition that we are particularly interested, and a brief recital of the history of a case that was referred to me, is as follows:

The patient, Mrs. B., age thirty-six, of average stature and weight, was usually in good health and was able to attend to her household duties. Concerning her first pregnancy, only meager information was obtainable; but it was stated that the delivery of the child was difficult, that forceps were used, and that the child was dead or died soon after birth. The patient became pregnant a second time and when in labor, Jan. 4, 1909, a physician was called and again it was found necessary to resort to instrumental delivery. Craniotomy was performed and the uterus was emptied of its contents. The patient recovered and there were no unusual complications following the extraction of the child.

On March 16, 1913, the patient, in labor for the third time, sent for her former physician. On arriving at the patient's home he learned that the pains had started at 2 P. M., March 15, and by 5 P. M., March 16 but little progress had been made; the pains were ineffectual, and the patient had become quite exhausted. At the examination it was found that the presenting head was high in the pelvis and, presumably, the bag of waters had ruptured some time previously so that, in effect, he was confronted with a dry labor. Instruments were employed to assist in the rotation of the head, and even after repeated application of forceps, the patient being anesthetized, it was found impossible to deliver the child. A skilled obstetrician was called into consultation, and the child being dead craniotomy was performed. It was stated that this latter procedure was carefully done and that no undue injury was done to the soft parts while this operation was in progress. The patient recovered nicely from the operation, and on the following day, March 17, her condition was very good. On March 18, the patient was feeling well and, without any warning, there was a sudden "explosion" and a considerable quantity of gas was passed through the vagina. Subsequently, fecal matter was also passed through the vagina. On the two following days the condition remained unchanged. The patient had no great discomfort, and at no time was the temperature over 100° F.

On March 21, she was sent to the hospital. Examination revealed that the discharge of fecal matter came from the cervix, though the location of the opening in the bowel was not discovered. The patient was placed on a restricted diet and the expectant treatment decided upon. Except for the presence of the fecal fistula, the patient showed general improvement.

On April 18, a proctologic examination was made and it was believed that the opening in the bowel was high up in the rectum. The patient was able to be up and about; but, naturally she was very anxious to be relieved of her condition since practically all of the fecal matter was discharged through the vagina, very little if any stool passing through the anus. The writer saw the patient at the hospital, May 16, and on the next day the following condition was found upon examination:

There was a fecal discharge from the vagina. All wounds of the vagina, such as follow delivery, were healed. Through the speculum it was noted that the external os was open, moderately lacerated, and that fecal matter came through the cervical canal. The cervix was adherent at the posterior portion. There was no pus; neither were there signs of inflammation. By digital examination the uterus was found slightly enlarged, adherent posteriorly at the cervical portion, though the fundus was slightly movable. The adnexa were free. The rectum was examined digitally and with the proctoscope, and even with the use of the sigmoidoscope the writer was unable to find the opening which communicated with the uterus. The character of the fecal matter indicated a fistula of the large bowel, and a tentative diagnosis of sigmoidouterine fistula was made and an operation for the cure or relief of the condition was recommended. During the four days preceding the operation the patient was given liquid diet and the rectum, vagina, and external parts were kept in a healthy condition by means of cleansing enemas and washes.

Operation.—On May 22, 1913, it was decided to attack the fistula by the vaginal route, and by laparotomy if necessary. Ether anesthesia was administered. The rectum and vagina having been well cleansed, through the posterior vaginal fold a dissection was made to expose the posterior wall of the cervix. The dissection was carried up as far as the fistulous tract which was loosened up and made as free as possible on all sides. The opening through the posterior vaginal wall also gave access to the culdesac of Douglas, and permitted digital examination of the abdominal portion of the fistula. Laparotomy was decided upon after a Fenger probe was inserted through the fistula into the intestine.

Laparotomy.—Left rectus incision. The uterus was somewhat enlarged and about the size of a man's fist. Tubes, ovaries and broad ligaments were normal but flaccid. The sigmoid flexure of the colon at a point a little below the middle portion was adherent to the uterus. There was no pelvic peritonitis and there were no adhesions aside from those taking part in the fistula. The condition resembled a lateral anastomosis of the sigmoid with the uterus, both loops of the bowel being free. The loop of sigmoid was dissected free from the lower portion of the uterus, and the opening in the bowel was closed with a double row of sutures. The opening in the uterus involved mostly the cervical portion, and this was closed, through the laparotomy opening, by means of deep and superficial sutures. Three small subserous fibroids were also easily removed. A cigarette drain leading into the vagina was placed in the culdesac. There being no special complications, the abdominal wound was closed in layers. The patient was given the usual postoperative care. On the sixth day the laparotomy wound showed some infection so that a portion had to be opened for drainage. The vaginal drain was also removed. A Bartholin gland on the right side showed enlargement.

On June 20, all wounds were healed. The uterus was of nearly normal size, and movable. The cervix and external os were large and there was a slight thickening of

the posterior part of the cervix where the repair had been made. Slight infection of Bartholin gland on right side was still present. Bowel movements and defecation were normal and painless. When the patient left the hospital she was happy and contented, her distressing condition having been relieved. In the following year she went to Europe, returning, however, before the outbreak of the war. Menstruation has been normal, and five years after the operation she was in good health.

The question which naturally arises is: What was the cause and manner of the formation of the intestinouterine fistula? Was it due to the trauma of instrumental delivery, to perforation, or to impaction and pressure necrosis? In several of the reported cases the complication followed instrumental delivery. Loenne[13] reports a case in which the woman was in labor for nearly two days, the bag of waters rupturing at the end of the first day. When the pains grew less effective, the physician finally applied high forceps. A living child was delivered. On the third day there were signs of infection, the patient later becoming septic. There was pus in the stools. The patient died and at the autopsy two perforations were found in the cecum as well as a perforation in the posterior wall of the uterus. There were feces in the pelvis and a widespread peritonitis. He quotes Franqué's case which was similar, there being likewise a perforation in the posterior wall of the uterus near the cervix.

In a case reported by Le Jemtel[12] a physician had been called in one and a half months after delivery when signs of infection had developed. He performed curettage and there was some improvement for a few days. The fever returned and shortly thereafter there was a discharge of feces through the cervix. There was also pus in the urine, and a purulent vaginal discharge. Intrauterine irrigating fluid soon passed through the anus. At operation an abscess was encountered which communicated with the bladder. The opening in the bladder was repaired and the cavity drained. The rectal opening closed spontaneously.

Graves[9] reports a case in which after forceps delivery there was perforation of the fundus of the uterus and prolapse of the small bowel into the vagina. The section of bowel had been removed, but there was discharge of feces through the vagina.

Petit[17] had collected up to 1882, 18 cases of intestinouterine fistula, but the cases occurred as complications of pregnancy and the manner in which these fistulæ are produced has not been satisfactorily explained. Where perforation is due to instrumentation the explanation is clear. In a number of cases associated with delivery, as in our own case, the perforation was at the posterior part of the uterus. It is hardly likely that in the application of forceps the instrument would cause injury to the posterior part of the uterus. A plausible explanation may be found in the fact that the fistulæ occurred in difficult labor cases. It is quite possible that the head not having rotated, became impacted between the symphysis pubis and the promontory of the

sacrum. Should by chance a mobile cecum or a loop of the sigmoid in such an instance be caught between the promontory of the sacrum and the uterus, undue and prolonged pressure would cause a necrosis of the uterus as well as the bowel. Adhesion of the bowel to the uterus may readily form and, in the favorable cases when the tissues break down, a fistula may be established between the bowel and the uterus. It is probable that such a process took place in our own case, since there was no pelvic peritonitis.

BIBLIOGRAPHY

[1]Amann, J. A., Jr.: Verhandl. d. deutsch. Gesellsch. f. Gynäk., 1899, viii, 463.
[2]Baldwin, A.: Proc. Roy. Soc. Med., London, 1913-14, vii, Surg. Sec., 71.
[3]Bernd, L. H.: Jour. Am. Med. Assn., 1905, xlv, 465.
[4]Bernd, L. H.: Proc. Philadelphia County Med. Soc., 1905-06, xxvi, 288.
[5]Bidder, A.: Verhandl. d. deutsch. Gesellsch. f. Chir., 1885, xiv, pt. 2, p. 52.
[6]Cursham, G.: London Med. Gaz., 1834, xiii, 943.
[7]Demarquay: Gaz. méd. de Paris, 1867, xxii, 341.
[8]Einbeck, A. T.: St. Louis Cour. Med., 1880, iv, 122.
[9]Graves, W. P.: Am. Jour. Obst., N. Y., 1908, lvii, 353.
[10]Hamon: Rev. méd. chir. d. mal. d. femmes, Paris, 1885, vii, 455.
[11]Huet, Ch.: Pres méd. belge, Brux., 1912, lxiv, 126.
[12]Le Jemtel: Bull. et mém. Soc. de chir. de Paris, 1908, n. s. xxxiv, 845.
[13]Loenne, F.: München med. Wehnschr., 1918, lxv, 1135.
[14]Moir, C.: Internat. Jour. Surg., N. Y., 1918, xxxi, 263.
[15]Neugebauer, F. L.: Rev. de gynéc. et de chir. abd., Paris, 1898, ii, 581.
[16]Peraire: Paris, Chirurg., 1911, iii, 823; idem., Gynécologie, Paris, 1912, xvi, 101.
[17]Petit, L. H.: Ann. de gynéc., Paris, 1882, xviii, 401; 1883, xix, 14.
[18]Schenck, W. L.: Tr. M. Soc. Kansas, Lawrence, 1879, xiii, 102.

THE EDUCATION OF NURSES FOR OBSTETRIC SERVICE

The Solution of a Sociologic Problem

By Sylvester J. Goodman, M.D., F.A.C.S., Columbus, Ohio

THERE are several fundamental facts which must enter into the consideration of the education of nurses for obstetric service. I think you will accept these without reservation. First, that if the world is to survive, women must continue to bear children. Second, that if women do bear children, they must have competent nursing in cooperation with skillful obstetric service. Third, that none of us can hope to see the day when all parturients can or will go to a hospital for delivery. Fourth, that there will always be patients who are unable to pay large fees for the services of the obstetrician and nurse. This does not apply to the charity class, but to the family of limited or fixed moderate income. Accepting the above as reasonable, let us see how we are concerned with this problem and endeavor to formulate some plan or system for dealing with the same.

Let us begin the consideration of this subject by looking into the matter of obstetric morbidity and mortality. In a recent article (Jour. Am. Med. Assn., 1, No. 8, Page 523), Dr. C. Henry Davis says, "There is a general impression among physicians that there has been a great improvement in the maternal mortality during the last half century. This impression is based on the present favorable maternal mortality records in hospital and dispensary services, and not on a comparison of mortality and birth statistics."

"During the past thirty years, deaths from many diseases have been reduced to a fraction of their former toll. The deaths from tuberculosis per hundred thousand population have dropped from 252 to 145.8; pneumonia from 186.9 to 82.9; diphtheria and croup from 97.8 to 15.7, diarrhea and enteritis under two years from 139.1 to 59.5; typhoid fever from 46.3 to 12.4. The death rate from diseases caused by pregnancy and the puerperal state, in 1890, was 15.3, while in 1915 it was 15.2. The maternal mortality in 1916 was 16.3 per hundred thousand population." "Few realize that for all the women of childbearing age, childbirth is the second greatest cause of death. For the year 1915, in the death registration area of the United States, there were, among women aged fifteen to forty-five, 29,000 deaths from tuberculosis; 10,134 from childbirth, of which 4,173 were from puerperal septicemia; 8766 from the various circulatory disturbances; 5549 from pneumonia; 5424 from cancer and other malignant tumors; while for all these ages syphilis was reported as the cause of death 647 times and gonorrhea 174 times."

Is this collection of statistics not startling? Can we not do something to better the conditions which contribute to such a state of affairs? The discussion of the nursing problem is a definite movement toward that goal. Many graduate nurses will not accept obstetric service. Some few will engage for the care of these patients if the delivery is to be made in a hospital. For the patient who cannot or will not go to a hospital it is almost impossible to secure a competent trained nurse. I am interested in this matter more from the standpoint of the practitioner than that of the specialist because it is to the family doctor we must look for better obstetrics.

I do not believe that pupil nurses are sufficiently impressed with the importance of this branch of service and the good that can be accomplished by the conscientious care of obstetric patients. They should be shown that practically all surgery is now performed in hospitals with pupil nurse attendants; that typhoid fever will be soon relegated to ancient history; that pneumonia and the various zymotic diseases will be either prevented or quickly cured; that contagious diseases will be treated in special hospitals. Then, there being no more war, obstetrics will be the principal service for the employment of trained nurses. It is a grave mistake if we allow the nursing profession to cast aside this service without some effort on our part.

The average nurse, graduated from our hospitals today, is a good surgical assistant. She can make dressings, assist in operations, give anesthetics and carry out postoperative orders better than the average medical man. For our surgical patients she is invaluable and many a patient owes his life to a good nurse as much as to the surgeon. For medical cases our nurses are fairly well trained considering the fact that most of our hospitals are really surgical infirmaries.

The average trained nurse is not a good obstetric nurse. She is not interested because obstetrics is not as spectacular as surgery and because there are two patients to attend. In some schools of nursing the lectures are so primitive that the pupils get nothing out of them; in other schools the teaching is so technical that the girls fail to grasp the subject, or, on the other hand, they become pseudoobstetricians and prefer only institutional work. I have discussed this subject with the heads of various training schools. They are very loath to reduce any of the requirements, and, as my good friend and teacher, Dr. J. F. Baldwin, says, "they seem to overlook the patient." The solution of the problem seems to me to be in the establishment of schools, or courses in existing schools, for the training of *Obstetric Attendants.*

Obstetric attendants need not receive as much instruction as is given the regular pupil nurse because they will be employed in maternity service only. The course need not last more than one year, if that long. They may be registered by the State if thought desirable.

There are many hospitals which do not have the requisite number

of beds for state registration. These institutions find it most difficult to secure enough pupils. The entrance requirements are so high that even the large hospitals have trouble filling their training schools. There are not enough girls, of the type required under the state entrance regulations, and if they are obliged to spend three years in order to secure the R.N. they naturally seek the larger hospitals. In the last few years many small hospitals, which were filling a great need in their respective communities, have been forced to close on account of inability to secure nurses. These smaller hospitals could do a great service in training these attendants. I believe that they would have little trouble in securing good girls for their schools if the requirements were less rigid and the course shorter.

These prospective pupils need not be high school or college graduates. There are many girls who can make a bed so that the patient is comfortable; who can comb a woman's hair; bathe a baby; keep a room orderly and be polite to domestic servants; who never had any training except that learned by helping mother. Many college graduates never learn to perform these helpful tasks.

There are some fundamentally important subjects that these *attendants* should learn. Naturally, they should be taught tact and loyalty to the attending physician, politeness (usually learned at home), kindness to patients, cleanliness, willingness to assume any *emergency* duty in the home, and the danger of talking too much. Above all, she should be taught to show some human sympathy to the parturient and be impressed that this is one of the most important attributes of a good obstetric attendant.

Pupil attendants should be given an elementary course in the anatomy and physiology of the female reproductive organs. They should have an idea of the appearance of the vulva when affected with lewd diseases and know how to use prophylactic measures against contamination and self-infection.

Antisepsis and asepsis should be drilled into the pupil at every step of her training. They should have at least three approved methods of cleansing the hands before attending at delivery. It is not necessary that they be given an advanced course in bacteriology but should be taught the value of a bar of soap and a rice straw brush. They should know how to sterilize the various utensils usually found in the household cupboard and which might be needed in "setting up" for a delivery at home. Even the homes of the rich will not have all the utensils to which trained nurses become accustomed in the hospital.

The attendant should have have an idea of what the expectant mother usually prepares in anticipation of confinement and should know the application of these articles. She should know what to do when she arrives at the home of the patient; the disposition of the children; the arrangement of the delivery room; the placing of the

bed with regard to light, heat and ventilation, open fires and doors; the means of securing water and other things needed in the room; how to make the patient comfortable and confident while awaiting the supreme moment. She need not know which blade of the forceps to hand the accoucheur if she has tact enough to win the confidence of the patient. It is important that she know how to use a rubber catheter and the method of preparing the vulva before employing that instrument.

It is very important that we teach them the care of the puerperal patient. The attendant must be instructed in the care of the breasts, too often neglected in the regular training schools, and the feeding of the babe at the breast. The care of the eyes, ears and nose of the newborn should be dwelt upon. The pupil need not be taught the preparation of an approved chart. She should be taught the use of a thermometer and, perhaps, the use of the hypodermic syringe. It would be well if she could keep a record of the lochia, breasts, amount of food taken by the babe, bowel movements, etc.; but, if the temperature is normal and the patient happy and contented, the attendant has fulfilled her purpose.

Attendants need not be taught how to control postpartum hemorrhage, except that they know how to properly massage the womb. However, she should be taught to recognize a convulsion and to put something between the teeth to avoid injury to the tongue of the patient. She should call your attention to eruptions, sores and discharges but need not know what to do in order to relieve these conditions. That is your own duty. She must *carry out orders as you leave them* and call upon *you* to make any changes. If we can train a large number of good, bright, clean girls, with average mental ability and an ordinary education, in schools adapted to this purpose, we will perform a great service for the public and go a long way toward the improvement in obstetrics so earnestly sought. We will not be treading upon the toes of any of the existing schools, or are we taking away any income from the regular trained nurses. The regular trained nurses will find plenty of work with the surgeons, public health and industrial services, institutional and teaching work.

We must have nursing service for obstetric cases. The public will thank us for educating these *obstetric attendants* because their work will be their specialty and their wages will be within the reach of the average patient. Thus more people will engage competent nursing care; the obstetrician will have less trouble securing help; obstetric nursing among the nonrich and the agricultural folk will be taken from the hands of ignorant old ladies and sepsis will be lessened. The nursing profession, the medical profession and our very necessary ally, *the public*, will all be satisfied.

CHOREA GRAVIDARUM

By Grandison D. Royston, M.D., St. Louis, Mo.

THE disease known as chorea gravidarum is rare; however it occurs more frequently than is generally thought. Williams[1] states that he has seen only one case of the grave variety, and that patient died despite early spontaneous premature labor. The comparatively little attention given this subject in American literature induces me to submit the reports of six cases, in the hope that they may be of some aid in the further study of a disease, with which we are as yet none too familiar.

While mentioned as early as 1594 by Schenkius,[2] and described in 1660 by Horstius,[3] it seemed to excite little more than passing interest until about the middle of the last century. We are told by Bumm,[3] and Meyer[4] that almost 10 per cent of all psychoses in women originate in the predisposing factors of toxemia, hemorrhage, infection, and lactation; however, a better obstetrical hygiene and management have reduced this to 4 or 5 per cent, and at the present time encourages the hope for further improvement along these lines. Kleist[5] reported from the neurological clinic in Halle 39 cases of chorea gravidarum among a total of 155 cases of chorea affecting both sexes. Muehlbaum[6] reported that among 65 females with chorea, between the ages of 16 and 30 years, 27.7 per cent had chorea gravidarum; Bonhoeffer[7] contends that more than half of the cases of chorea gravidarum are recurrences of chorea which had existed before the onset of pregnancy. Many text-books and writers on the subject claim that heredity plays a part in the causation of the disease; Wollenberg[8] found among 539 cases of chorea minor, only 2 per cent of the parents had had chorea, and 1.5 per cent affected the mothers. Buist[9] reported among 203 cases that the onset of the disease occurred 108 times during the first 3 months; 70 times during the second 3 months; 25 times during the last 3 months, and 16 times postpartum.

The etiology of chorea gravidarum is unknown. French and Hicks[10] reported 29 consecutive cases treated in Guy's Hospital during the preceding thirty years; 19 of these patients had had rheumatism or chorea previously, and of these, 15 had had chorea before marriage; hence these writers feel convinced that chorea gravidarum and infantile chorea possess a similar pathology and have a tendency to recur in subsequent pregnancies. Buist's figures show that among 226 patients there were 66 with previous attacks of chorea, and 25 more gave histories of attacks of acute rheumatism without chorea, while 20 additional patients gave histories of attacks of acute rheumatism and chorea. Wall and Andrews[11] reported a history of previous chorea in 16 out of 37

cases with chorea gravidarum. Other investigators as Quigley,[12] Graves and Paige,[13] and Mackey[15] argue that the disease is of infectious origin. Birnbaum[23] reports that bacteria, mostly streptococci, as well as small cerebral emboli from endocarditic processes, are often found in the brain, a view with which many other investigators agree. Duckworth[16] emphasizes a rheumatic source or origin of the disease and contends that many instances of rheumatic conditions of lesser degree with endocardial involvement escape recognition because of the absence of much pain or fever; most of the cases of rheumatism reported being of the severe type. He agrees with Poynton, Payne, and Sänger, whom he quotes, that the only question now remaining to be settled is what variety of streptococcus causes the disease.

Sänger[17] submits as evidence of the uterine origin of the disease the fact that convulsions, twitchings, etc., disappear almost without exception after the uterus is emptied, and he states further that only 7 cases are on record where chorea extended beyond the puerperium. W. F. Shaw[18] considers the disease toxemic in origin and reported the treatment of 32 consecutive cases by rest and elimination, without the induction of labor and without a death; however, a study of Shaw's cases seems to indicate that they were of a relatively mild type. Hirschl[19] states that most instances of chorea in obstetrical practice are cases of Sydenham's chorea, or chorea minor, and are apparently due to toxins in the circulation, either in increased amount, or an increased harmful action upon the nervous system, such a condition causing chorea gravidarum or a marked predisposition toward it and suggests the possibility of a fetal source of the disease. He reports that autopsy findings often show small cerebral hemorrhages and vascular emboli, with subsequent inflammatory involvement of the vessel coats, originating in endocarditic processes.

Harding[20] suggests that because of the rapid improvement occurring in some cases of chorea gravidarum after emptying the uterus, the etiological factor must be a toxin arising from a lack of compensatory balance of the internal secretions and a consequent disturbance of metabolism during pregnancy. The same writer agrees with Oppenheim whom he quotes as stating that the above-mentioned factors plus the emotional tendencies of the pregnant woman explain why chorea gravidarum is so much more inclined to become chorea insaniens.

The prognosis of the disease is very variable; for instance, the prognosis of pregnancy in a choreic individual is usually unimportant, while a chorea appearing for the first time only after conception is always of serious import and the failure to differentiate these two conditions probably explains the marked variations in mortality figures: French and Hicks 10 per cent; Buist 17.6 per cent; Schrock[21] 22 per cent; Fehling[22] 36 per cent; Birnbaum[23] 17.5 to 32 per cent.

French and Hicks consider the presence of fever to be very significant, a view not given so much importance by others. Among their 26 cases that recovered, not one had a temperature above 99, whereas in all (3) of their fatal cases there was marked pyrexia. They consider that pregnancy would justify a grave prognosis, if no obvious acute tonsillitis or other such cause for pyrexia can be found. They consider the prognosis good as long as there is no fever, regardless of choreic movements. They also feel that in a chorea gravidarum of several weeks' standing, when psychoses appear simulating delirium, especially hallucinations of vision or perhaps melancholia with increased anxiety or fever, very seldom stupor, that recovery is the rule unless exhaustion or acute delirium cause death. Birnbaum states that the temperature is usually normal except in endocarditis, pneumonia, sepsis, and abscess; also in severe psychic disturbances, as acute mania, etc., fever occurring shortly before death; the fever is of central origin, from damaged heat centers. He believes with Fellner,[24] that if, after a varying length of time, delirium suddenly appears with great mental disturbance, refusal or inability to take nourishment and great motor unrest plus increased temperature (fever), etc., that death usually occurs within one to three weeks. Hirschl believes that if the first week of the disease is passed satisfactorily, the greatest danger is over. A. Martin[25] is of the opinion that recurrences are very prone to take place during pregnancy; he also believes that the danger to life from chorea is usually from a severe endocarditis, meningitis, or similar complication. Schrock agrees with Hirschl that the nearer the end of pregnancy, the more favorable the prognosis. Spiegelberg[26] contends that less than one-half of the cases go to the end of normal pregnancy. He places the maternal mortality at 26.9 per cent, which is increased if complications are present. Muehlbaum considers one of the most significant signs of a bad prognosis to be the predominance of psychic over motor delirious symptoms in the beginning of the disease. He believes that the only favorable prognosis is in those cases that have had chorea in childhood; also that a gradual onset and a good physical condition together lend a more favorable outlook; and that recurrent choreas in subsequent pregnancies add to the gravity of the disease.

The opinions as to the treatment of chorea gravidarum vary. Such British investigators as Wall and Andrews, Shaw, Croft,[27] and others, argue in favor of the medicinal treatment and against the induction of labor. LePage,[28] after reporting abstracts of 20 fatal cases of chorea gravidarum where labor was not induced, concludes that it is safer to treat such cases by the early induction of labor; where induction is delayed, the results are very bad. He also concludes that anesthetics are badly tolerated in these cases. French and Hicks advocate the medicinal treatment, as in the nonpregnant cases. They believe that if labor is to be induced at all, it should be done before the onset of fever, which, they

feel, cannot be anticipated in enough cases to warrant induction before pyrexia begins, after which it is too late.

Bonhoeffer takes the view that over half the instances of chorea gravidarum are recurrences of chorea of childhood and are harmless; but that a first attack of chorea during pregnancy, accompanied by marked motor disturbances, forms an indication for the interruption of pregnancy. He emphasizes the danger of septic endometritis and septic endocarditis following infections of skin abrasions caused by the "motor unrest." Hellier [29] strongly advises terminating pregnancy in severe cases and expects improvement after two or three days following delivery. His views are thus stated: "When movements are slight; when the patient can eat and sleep well and maintain her weight; when the pulse is under 100 and there is no fever, or when confinement to bed suffices to keep the patient fairly quiet and comfortable, then there are no indications for radical measures." He gives the following indications for terminating pregnancy: "When there are violent movements despite rest in bed and sedatives; when there is inability to sleep or eat enough, accompanied by loss of weight; when mental conditions are confused, and when there is a tendency to delirium, rise of temperature, and a dry tongue, *especially when the pulse rate is persistently* above one hundred and becoming weaker and more rapid, then the indications for the interruption of pregnancy are complete and absolute. However, waiting for all such absolute indications may be too long, and in attempting to save the fetus, both mother and fetus may be lost by the delay." Spiegelberg treats each patient individually and empties the uterus as soon as the patient begins losing ground, as is evidenced by exhaustion, loss of weight, sleep etc., and a temperature of 37.8° C. or more. Bumm's opinion is that one-third of all cases of chorea gravidarum are of the acute type, and since medicinal treatment in such severe cases has repeatedly resulted fatally, it is futile again to experience such bad results and postpone until too late the only life saving therapy,—emptying of the uterus. Bumm favors vaginal hysterotomy as a means of rapid emptying of the uterus, a view advocated by Martin and by Anton.[30] The case reports that follow are given in considerable detail direct from the hospital records in order that the various phases of the disease may be noted.

CASE REPORTS*

CASE 1.—Ob. 1961, M. J. D., married, white, U. S., aged twenty years. Grav. i. Admitted to Barnes Hospital, February 21, 1918, in the middle of the last month of her pregnancy, complaining of fever and tender joints (right shoulder, left knee, and left wrist) for the past few days; visible evidence of acute inflammation (arthritis) present. Temperature 98; pulse 120; respiration 24. Patient could not talk very well; some choreiform movements and speech disturbance present.

She had been treated in the medical service, (medical history 1572) from October

*From Washington University School of Medicine, Service of Professor Henry Schwarz.

15, 1915, to November 19, 1915, from which the following abstract is taken: *Chief complaint.*—Pain in right hip changing over into left side at times; difficulty in speech; nervous headaches confined to frontal and occipital regions.

Family History.—Father died at 36 of tuberculosis and alcoholism; family history is negative as to neurological conditions. *Past History.*—Always weakly; choreiform movements since infancy; "spasms" or attacks suggestive of epilepsy between the ages of 2 and 12; only one such attack since the age of 12. Had measles, pertussis, varicella in infancy; scarlatina in childhood was followed by defective hearing. Incoordinate jerking movements present during examination. *Examination.*—Tonsillitis, rheumatism, chorea, slight enlargement and overactive heart; aortic impure, all sounds accentuated; tonsils enlarged; Babinski (†). Temperature always normal. Cell count (spinal fluid) 1; Noguchi reaction negative; Rinné and Weber to right (Koetter); sensory negative. *Nose and Throat Examination.*—Chronic rhinitis; posterior ethmoid and sphenoid suppuration; bilateral chronic tonsillitis. Blood pressure 126-72; red cells 5,200,000; white cells 6,600; hb. 80 per cent. Wassermann negative. *Diagnosis.*—Pseudosclerosis. *Treatment.*—Out of doors as much as possible alternating with rest in bed; forced diet.

November 7, 1917. Patient admitted to out-patient obstetrical service for an apparently normal pregnancy of 23 weeks' gestation. Her menses began at 14; always fairly regular and of the 28-day type, duration 7 days, and profuse. Last menstruation May 30, 1917; fetal movements felt October 29, 1917. Aside from a moderate amount of nausea and vomiting, headaches and eye disturbances during the first three months of gestation, patient had felt very well. At the time of her first obstetrical consultation she complained of some itching and tingling about her nipples; slight edema of the feet; bowels fairly regular, though patient takes syrup of figs about once a week. Heart and lung examinations normal; pelvic examination and measurements present no abnormalities. Urine always negative. Blood pressure ranged from 100-63 to 122-78 from November 7, 1917, until she entered the hospital on February 21, 1918, complaining as she did when first seen. At this time she had a heart murmur. She was delivered at full term by low forceps, labor beginning spontaneously on March 2, 1918. There was a small tear 1 cm. long on the right side of the cervix, followed by a pelvic cellulitis of moderate extent in the base of the broad ligament of the same side. Temperature ranged from 97° to 102° from the fourth to the twenty-second of March, 1918, and the pulse ranged between 80 and 120. Wassermann blood test on March 7, was positive, 3 plus; Wassermann repeated March 14, negative; complement-fixation test March 7, negative. Patient left hospital against advice of physician on March 22, 1918; at this time she had a chronic endocarditic murmur and subinvolution.

CASE 2.—Ob. 2024, E. R. S., white, U. S., aged twenty years. Married two months. Admitted to Barnes Hospital on April 13, 1918, at 11:30 A.M., suffering with chorea gravidarum; symptoms severe for ten days before admission. Pulse 110; respiration 24. Patient was second child, born prematurely at seven months' gestation, weight 3½ pounds. Her mother was suffering with nervous prostration at the time the child was born. Labor normal. When patient was four months old, she was normal as to weight, development, etc. One paternal aunt was considered "erratic" from an injury at birth. She had measles and pertussis in childhood; no serious illnesses or operations. *Menses* began at thirteen; always regular; of the 28-day type, duration 3 to 4 days, no pain. *Date of last menstruation,* February 1, 1918. *Married* on February 15, 1918; no period since marriage at San Antonio where a sister and her baby were with the sister's husband, an aviator, who departed for France shortly after patient's marriage. Patient greatly excited and

worried over safety of brother-in-law. Patient's husband, too, was told that he might be called to France at any moment.

History as Obtained from Husband.—Patient had tonsillitis early in January, 1918. Attending physician advised tonsillectomy, to be done later. Patient was well until the first week in February when, because of nervousness, she consulted a physician who diagnosticated a tachycardia, probably due to expected wedding February 15, 1918. About one week before this, she complained of a sore right wrist, but did nothing for it. She was well on wedding trip except for an occasional soreness of shoulder and leg, thought to be rheumatism; this soon disappeared and patient seemed well until March 25, 1918, when she consulted another doctor who told her that she was pregnant. This information made her quite nervous and irritable. Patient was ordered to bed; but as there was a rapid increase in her nervousness and irritability, she was advised to return to her home in New York for a complete rest. About the second week in April she complained of her right wrist and a great deal of twitching of the right arm; warm applications soothed her. There was great difficulty in getting patient to take food except milk and orange juice. While at Kelly aviation field, she was greatly distressed regarding several fatal accidents which she had witnessed.

April 14, 1918. Delirium and movements very marked. 11:00 A.M. Curettage. Uterine cavity five inches in length. 8:00 P.M. Patient was very noisy and irrational; could recognize attending physicians and her mother, but could not be quieted; given 1.5 c.c. scopolamine; abundant fluids by mouth plus a nutrient enema of dextri-maltose 30, erepton 20 gm., water 200 gm. 8:45 P.M. Sleeping since 8:30 P.M., given scopolamine 1.5 (gr. 1/133), following which she had uninterrupted sleep until midnight, then 1 c.c. scopolamine; slept until 3:15 A.M., when 1 c.c. scopolamine was again given.

April 15, 1918, 5:15 A.M., 1.5 c.c. scopolamine plus a few drops of chloroform to quiet patient who then went to sleep after expelling nutrient enema and taking 200 c.c. milk by mouth. She had very marked choreiform movements of right arm; delusions; involuntary stools; her buttocks and sacrum were chafed because of movements about bed. 12:30 P.M. Worries about "These two women who have caused her so much trouble and who will die the same death she is now dying;" says she saw von Hindenburg standing outside her door disguised as a doctor. Patient placed under scopolamine, narcophine, or morphine seminarcosis (usually 1 to 6 injections of scopolamine and 1/8 to 1/6 gr. morphine or ½ gr. narcophine) every night for ten successive nights, from April 14, 1918, until April 24, 1918. Patient was always more or less noisy and irrational when awake; thinks all women murderesses, and sees eels and snakes.

April 19th. Red cell count 4,480,000; white cells 14,200; hemoglobin 85 per cent. May 5. Red cell count 5,872,000; white cells 7,600; hemoglobin 80 per cent.

April 19. Differential count, polynuclears, 59 per cent; lymphocytes, 38 per cent; large mononuclears, 3 per cent. May 5. Differential count, polynuclears 69 per cent; lymphocytes 27 per cent; large mononuclears 2 per cent; eosinophiles 1 per cent. April 18, 1918. Blood culture (72 hours) negative. Systolic, endocarditic bruit, heard at base and at apex, transmitted to axilla. Spleen and liver negative. Given bromides, chloral, trional, etc., until May 4, 1918, when they were discontinued.

May 1. Still voids urine involuntarily; is noisy and boisterous. May 7. Condition unchanged, except for the cessation of choreiform movements two days ago. May 12. Visited by husband whom she did not recognize, though the day before she talked rationally for a time and then rambled on incoherently. General nutrition good; still on liquid diet, milk, soups, broth, chocolate, etc., plus dextrose 1 oz., trophonine 1 oz., water 4 oz., twice daily as an enema and normal saline 200 c.c. per rectum every four hours. May 22. For past few days becoming more rational; asks for

nightgown; does not soil bed as before; takes plenty of nourishment; becomes rather noisy at night and late in afternoon; moved from isolated quarters to regular room in private pavilion much to patient's delight. June 1. Steady improvement, though at times becomes very noisy and throws hair brush at nurse; sleeps well; takes daily tub baths. June 13. Mitral on systolic murmur, compensated. Discharge note: "Patient entered hospital suffering with chorea gravidarum and rather severe mental symptoms of right hemichorea; symptoms severe for ten days. Patient became disoriented and required at first a fair amount of sedative medication and restraint. About May 5, 1918, chorea had disappeared. May 22, 1918, mental symptoms improved. The improvement, mentally and physically, continued, so that now she is about normal. At times, patient is disoriented, not able to identify people and inclined to be silly. All this, however, is rapidly disappearing and patient was permitted to go home on June 17, 1918." September 15. Letters from patient's parents show that patient made a rapid and perfect recovery.

CASE 3.—Ob. 1179, M. W., white, aged twenty-five years. Married. Born in Germany. Gravida, i. Admitted to Barnes Hospital on May 25, 1915. Unable to talk intelligibly. *Family History.*—Negative. *Personal History.*—Severe sore throat three months ago. No history of rheumatism. Gynecologic operation for "turning of womb" one year ago, after which menses were regular. Married on December 7, 1914. Was perfectly well until one week before admission. Failed to menstruate when due and began worrying over the possibility of being pregnant. Four days before admission to hospital she began making purposeless movements and talking unintelligibly. At present she no longer recognizes her husband or friends. Patient much worried because husband is out of work Seems obsessed with the idea that she will never recover; no attempts at violence; good sphincter control. *Status praesens.*—Hiccough; groaning; alternately laughing and crying; twitching of various muscles of the face and extremities; eyes continuously moving about; cannot answer questions intelligently; shows evidences of lack of concentration; movements seem choreic, though not typical; teeth defective; throat negative; temperature 100; pulse 108.

May 26, 1915. "Patient disoriented, confused, shows evidence of acute maniacal excitement; restraint necessary; marked choreiform movements; grimaces, gnashing of teeth, gutteral sounds are constantly observed. Patient seems under control of self-accusation. Combination of choreiform movements with acute maniacal excitement makes the diagnosis, chorea insaniens, definite." [Schwab.] Question of pregnancy not determined; possibility of a streptococcus infection of the tonsil, or elsewhere suspected. Treatment: symptomatic, with as little restraint as possible.

May 27. Psychomotor restlessness is very marked, with definite choreiform movements; temperature suggests the possibility of an infection as the basis of chorea. Leucocyte count at 10:00 A.M. was 28,500; red cells 4,400,000; hemoglobin 70 per cent. *Differential Count.*—Polynuclears 66 per cent; mononuclears 16 per cent; transitionals and large mononuclears 14 per cent; eosinophiles 4 per cent; blood pressure 110-60. Temperature ranged from 100° to 102°; condition showed little change; still in restraining sheet; choreiform movements present in diaphragm and noticeable when patient attempts to speak; movements in general are wild and purposeless; mental attitude enormously depressed; patient thinks she is doomed to die as punishment for some wrong committed in connection with a doctor and midwife. Herpetic eruption about the face. There is an element of depressive insanity in addition to the chorea.

May 28. Curetted; very small ovum and decidua removed; ether anesthesia; spinal fluid obtained. May 30. Patient worse; more restless; exhausted with move-

ments; cannot speak above a whisper; speech incoherent. June 4. Choreiform movements have ceased; patient more or less quiet and motionless; great depression; general apathy; speech unintelligible. June 14. More rational for past three to four days; appears to notice surroundings; eats better. Fowler's solution, 5 minims three times daily. June 28. Improving slowly; Fowler's solution stopped and elixir of iron, quinine and strychnine substituted; at times, patient fairly quiet; looks brighter. July 4. Choreiform movements practically gone; patient quiet; shows no interest in surroundings; answers questions slowly, but with difficulty. Marked depression noticeable; no excitement. July 5. No traces of choreiform movements to be observed; patient restless but shows some psychomotor symptoms; intelligence much improved; questions answered promptly and accurately. Patient appears to be willing to talk about herself and her future plans. It is evident that the paranoic delusions still persist and are influencing patient's train of thought at intervals. It is impossible to say just how strong they may be in influencing the future conduct of the patient, nor how much they may be capable of being suppressed. The duration of the delusions is also a matter of doubt, because they may have existed long before the present illness. Patient could be sent home and allowed to come to the Out-Patient Department, Neurological Clinic, for future study. July 11. Mind clearing up; is quite rational; only a slight nervousness present; pelvic findings are normal. Patient is discharged improved. *Diagnosis.*—Toxemia of pregnancy; chorea. *Treatment.*—Induction of abortion, curettage; morphine, hyoscine, iron, arsenic, forced feeding, etc. *Note.*—Husband informed me that patient gave birth to a full-term child 15 months after her discharge from the hospital. She had a perfectly normal pregnancy, labor, and puerperium, and there was no sign of any recurrence of her former condition. At the time this information was obtained, the baby was about three months old and the mother was in excellent mental condition.

CASE 4.—Med. No. 6161. F. M. P.; white, U. S., married, aged twenty-one; grav. ii. Admitted to Barnes Hospital October 8, 1919; suffers from a "nervous breakdown." *Family History.*—Negative. *Personal History.*—Measles, varicella, and mumps in childhood; no sequelæ or complications; scarlatina, six months ago, following which there is a history of present trouble. *Menstrual History.*—Indefinite and not recorded. Married two and one-half years; 1 full-term normal pregnancy, healthy child; no abortions.

Present Illness.—Began some six months ago, following a mild (?) attack of scarlatina of two weeks' duration; after this, patient complained of headaches, backaches, nausea, and occasional vomiting; these attacks lasting from two to three days and recurring at intervals of four or five days; no increase in urinary frequency. The present condition began two weeks before admission to hospital, when patient went to bed because of "nervous twitchings" beginning on the entire left side and extending to the right; severe backache; involuntary control over muscular movements; sphincter control is present; mind rational.

October 8, 1919, 3:30 A.M. Temperature 99.6°; pulse 90. No history of tonsil or joint involvement; answers questions rationally; has continuous athetoid twisting movements involving arms, head, thumbs, and legs; no muscular twitching. There is a reddened pustular area, about the size of a 25 cent piece, on the right forearm. 12:00 noon. Entirely irrational; movements are thrashing in character; placed in a restraining jacket. October 9th. Patient in constant choreic movements of face and extremities; heart negative. Hyoscine hydrobromide, gr. 1/150 (hypo.); soft diet; sodium bromide, 30 gr. three times daily; morphine gr. ¼ every three hours. 8:00 P.M. Temperature 108°; pulse 140; this was reduced by means of hydrotherapy; at

4 A.M., October 10, temperature was 97°; pulse 110. Soft diet discontinued, liquids substituted.

October 9, 10:30 A.M., hot pack in blankets; jacket removed. 2:30 P.M. Broke off needle in patient; general anesthetic given to remove same; 500 c.c. of 4 per cent glucose injected. 5:15 P.M. Kept in bath at 98° F. for one hour; always violent movements except for two or three minute pauses from exhaustion; four to five people always necessary to restrain patient. 7:00 P.M. Patient somewhat improved; apparently understands, but is unable to answer because of inability to control lips and tongue; morphine gr. ¼; hyoscine gr. 1/100 given. 7:30 P. M. Sleeping; rectal temperature 108°; given colonic flushing of tap water; floors and walls padded with mattresses and patient turned loose on floor with special nurse in room. 8:25 P.M. Rectal temperature 103°. 10:30 P.M. Absolutely quiet for past hour. 11:45 P.M. Patient awake and choreic movements recurring, though less violent; seems perfectly clear mentally and able to answer questions promptly.

October 10, 1919, 9:00 A.M. Mentally clear; pupils do not react to light; impossible to see eye grounds; blood pressure 70-55; condition seems choreic; ordered continuation of two hour feedings, especially milk, buttermilk, fruit juice, forced water; drip if necessary. 11:50 A.M. Complains of abdominal pain; patient claims that she miscarried and an examination of the bed pan disclosed a four months' fetus. An intact placenta was expressed without pain; no abnormal bleeding; all pain ceased with the expression of the placenta and patient promptly went to sleep. Routine postpartum care ordered. Patient slept most of the time for the next three to four hours, except when abrasions were rubbed with an ointment. When she was awake, mild choreiform movements were present.

October 11, 1919. Eyes look large; chalazion on one lid. Eye grounds negative; no further choreiform movements to any extent. October 15. Acne eruption. October 18. Ferric sulphate and quinine, each gr. 2, and calcium sulphate gr. ¼ after meals. October 19. Unable to detect any further choreiform movements. October 26. Discharge Note: Upon admission, patient presented the hyperkinetic picture of a severe chorea; at times almost bordering on delirium. No treatment was particularly effective, although hyoscine, morphine, hot packs, continuous hot baths, etc., were used, until the second day of residence in hospital when the spontaneous abortion of a four months' fetus occurred. From that time on, rapid improvement ensued. However, a pyogenic infection of the abraded skin of the right arm and shoulder necessitated a week's further treatment before complete recovery. Choreiform movements and acute maniacal state form the composite clinical picture presented by this case. The urinalyses were always negative except for a very few granular casts and a very faint trace of albumen on October 12, 1919. *Blood examination*, October 10: Red cells, 3,440,000; white cells 22,600; hemoglobin 80 per cent. October 13. White cells 23,600; October 14, white cells 15,400; October 15, white cells 14,400; October 19, white cells 16,600. Differential count, October 20: Large mononuclears and transitionals 8 per cent; lymphocytes 15 per cent; neutrophiles 74 per cent; eosinophiles 1½ per cent; total cells counted 161.

Temperature, on admission October 8, 1919, 99.6° F.; pulse 90. 7:30 P.M. October 9: Temperature 108°; pulse 140; at 8:25 A.M., temperature 103°; 4:00 A.M., October 10, temperature 97°; pulse 110. After delivery, October 10; temperature was remittent, from 99 to 100.5° F. until October 15, after which it was intermittent from 97.6° F. to 100° F.; it was normal when patient was discharged October 26, 1919.

CASE 5.—Gyn. 1946, M. P. D.; white; single; U. S., aged twenty-one; clerk; grav. i. Applied at the surgical dispensary June 23, 1919, complaining of the presence of a

tumor of the "left side" for the past two months; no menses for four months. She gave a history of having had every Spring for the past four years, choreiform movements of the left hand, less so in the left leg; also that she would become "jerky," tongue felt heavy and she could not talk very well at such times. July 1, 1919. Referred to gynecological service of Barnes Hospital. Patient very nervous and restless. Temperature 99.5°; cries easily; does not want to remain in ward; she is frail and anemic; weighs 105 pounds; slight choreic movements limited to right side. *Personal History.*—Fell from top of a moving van when three or four years of age, and was unable to speak after this for more than one year. Four years ago she had an attack of chorea with fever and delirium; patient was in bed for four or five months, then recovered sufficiently to work. She was seen in the dispensary in July 1915, when she was unable to speak plainly and had slight choreiform movements of the right side; at this time she was treated with liq. potass. arsenitis for two months and, apparently, made a complete recovery. Patient worked as a clerk from that time until June 21, 1919. She had had several attacks of malaria; no history of rheumatism. *Menses* began at 11; regularly recurring every 28 days; duration three days; flow scant; pain before onset of flow, dating from nervous attack four years before; denies exposure to impregnation.

Present Illness.—Enters hospital because of tumor in abdomen, which she says moves. Patient admits exposure to impregnation and admits worrying over condition. *Physical Examination.*—Slight hypertrophy of right tonsil; slight adenoid mass; heart slightly enlarged, irregular, and rather rapid; slight roughened systolic second sound; right nephroptosis; fundus uteri extends 6½ cm. above symphysis. Temperature 99.5°. July 7. Refused noon meal; crying; complains of tongue being heavy and unable to swallow; examination reveals no visible abnormality; placed under observation. July 12. Diagnosis made of pregnancy and chorea. July 13. Blood pressure, 99-62.

July 22. Patient very noisy all day; crying and fits of wild excitement; ran down fire escape from third to first floor; claims someone shot her in the back and has been threatened. July 24. Restless; moaning; placed in restraining sheet; few minutes later, 11:50 P.M., a loud noise was heard in the corridor; patient had escaped from restraining sheet and was found hiding in a small closet; she resisted every effort to be put back to bed, crying: "Don't hurt me," and "Did you kill my mother." She was placed in a restraining sheet and given 1 c.c. of hyoscine hydrobromide solution (gr. 1/200). July 25. Patient totally disoriented; numerous hallucinations and delusions; seeing men at door and about room threatening her with firearms; also thinks they are trying to kill her mother; refers these delusions to various people working about her. *Diagnosis.*—Psychosis associated with chorea accentuated by pregnancy. *Prognosis* unfavorable as to life; may be improved if pregnancy is interrupted.

July 25. Left lids swollen from several large hordeola of upper lid; acute conjunctivitis of left eye; incision of hordeola recommended; frequent irrigations with boric acid solution, silvol in each eye every three hours. July 26th, 8:30 A.M. Intermittently rational and oriented. Two and one-half c.c. hyoscine hydrobromide given. At 10:30 A.M., a uterine bougie was inserted and the vagina packed with sterile gauze. 2:15 P.M. Awake, asking for doctor, mumbling and becoming loud of voice; given 1 c.c. of hyoscine. 5:30 P.M. Complaining of abdominal pain, irrational and violent most of time despite a total of 17 doses of hyoscine given between 2:15 P.M., July 26, and 12:00 noon, July 28. Uterine bougie removed; cervix admitting finger; this dilatation was increased by means of a Goodell dilator, membranes ruptured and uterine and vaginal gauze packs inserted. 1:30 P.M. Awake and crying with abdominal pain; 1 c.c. hyoscine solution. Strong uterine contractions. July 29, 1919,

9:00 A.M. Very restless and noisy; biting, kicking, jumped out of bed; put in straight jacket and given 1 c.c. hyoscine and morphine sulphate, gr. ¼. 11:20 A.M. Patient quiet; rectal temperature 105.2°; pack removed from vagina and uterus; os still shows only one finger dilatation; cervix partly obliterated. 650 c.c. urine removed by catheter. 12:35 P.M. Anesthetized; Bossi dilator used to dilate cervix to 6 cm., fetus extracted by breech and placenta partly expressed manually and the remnants completely detached with finger; cervical tear on left; 1 c.c. sterile ergot injected intramuscularly. 4:30 P.M. Temperature 106.8°; comatose; given digitalin gr. 1/30 every four hours; sponge bath reduced temperature to 105.2° at 6:00 P.M. 7:15 P.M. Acetone and diacetic acid found in urine; intravenous injection of 400 c.c. of 5 per cent soda bicarbonate solution, following which blood pressure was 78-48. 7:35 P.M. Systolic blood pressure 64; given camphorated oil m.xv intramuscularly. 9:15 P.M. Blood pressure 42-30. 10:15 P.M. Died.

Blood culture and Wassermann test were negative; urine always normal until July 28th, when ½ gram albumin per liter was found; acetone and diacetic acid were found on day of exitus. Blood count, July 13, red cells 3,288,000; white 9,000; hemoglobin 80 per cent. No autopsy was obtained.

CASE 6.—Ob. 1048. J. L.; white; aged twenty-five; married; U. S., housewife; gravida iv. Admitted to Washington University Hospital October 11, 1914, suffering with acute chorea gravidarum; pregnant 31 weeks. Patient gave a history of having been perfectly well until four weeks before admission when she complained of headaches and dizziness for about four days and then began to have irregular jerky movements of the left arm. These movements were not very marked, and did not give patient very much trouble. Two weeks before admission these symptoms became so severe that patient went to bed and, one week later, she was taken to the City Hospital, but remained there only three hours; insisted upon being removed immediately. Since then her condition had remained practically unchanged.

Personal History.—No rheumatism, tonsillitis, chorea, heart trouble, or serious illness of any kind. Patient had three normal full-term pregnancies and labors; she did not menstruate after first pregnancies until last child was born. All children living and healthy, ages five, three and one-half, and two years; puerpera uneventful; has been working hard at home. On admission she was having constant jerky irregular movements of the left side of face and left arm. Cheeks and chin were flushed. She was well oriented as to time and place; seemed rational and, except for an occasional incoherent remark, had no hallucinations or delusions; no loss of consciousness; speech was slightly halting; no tremors; good sphincter control; no history of attacks during her sleep.

Physical Examination.—Eyes react sluggishly; ears and nose negative; teeth fair, though considerably repaired; pharynx slightly congested; tongue deviated to right, moves irregularly, but has no tremor; heart negative, aside from a slight blowing systolic murmur, best heard in the second left intercostal space; lungs negative. The abdomen had no palpable viscera beyond a pregnant uterus of 31 weeks' gestation; fetal heart sounds heard in left lower quadrant, 150 per minute. Patient is of good muscular development; strength of both upper extremities equal; she is unable to control movements of left arm; surface temperature of latter slightly higher than on the right side; no adenopathy; reflexes well marked and equal on both sides; lower extremities negative, reflexes equal on both sides and quite distinct. Blood pressure 125-78.

October 13. Choreiform movements have increased in violence and distribution; patient throws herself from side to side; motor restlessness very marked; patient is delirious and has hallucinations; emotional state is variable with tendency to weep-

ing; illusions have reference to murder and destruction of her family; mental confusion is striking. *Diagnosis*: Toxic delirium incident to chorea of pregnancy. Patient put upon forced feeding. She was delivered at 1:25 P.M., October 13, by accouchement forcé. Child weighed 2290 grams and died three hours after delivery.

October 15. Patient seemed to become more quiet after labor: but at 1:00 A.M., the morning following delivery, she became very delirious and had to be placed in a restraining sheet; morphine sulphate gr. ¼, repeated after two hours, had little if any effect; she was then given morphine sulphate gr. ¼ with hyoscine gr. 1/100 every three hours and remained quiet for a time. October 17. Patient's general condition seemed better, not moving her limbs so much as before; temperature 101.4° F.; corresponding pulse rate and of good volume. October 19th. Patient's condition seemed much improved, but later became very restless and required morphine and hyoscine. Herpes labialis for several days. Blood count: Red cells 4,728,000; white cells 15,880; hemoglobin 80 per cent.

October 21. Condition has become slowly worse; delirium very marked; jerks moderately in her sleep; temperature increased gradually from 102° F. to 107.6° F. at 10:00 A.M.; pulse 160. For past several days patient has had an eruption over the left hand, arm, and buttocks, consisting of superficial vesicles filled with a seropurulent material; left hand swollen and pitting on pressure, though no constriction of arm or injury found to account for it. The soft systolic murmur, found on admission, has changed to a louder to-and-fro sound. Patient was given 10 c.c. of antistreptococcic serum. Blood culture negative. Leucocyte count 21,560; hemoglobin 80 per cent. Patient remained comatose all day. October 21, 3:40 P.M. Rectal temperature 109.6°. She died at 4:32 P. M. Temperature (rectal) immediately after death 110.2°. Daily urinalysis showed moderate amount of albumin, no casts. No autopsy was obtained.

Of these six cases, ordinarily classed as chorea gravidarum, there seem to be two conditions included,—ordinary chorea minor and a chorea due to toxins incidental to pregnancy. There are instances of both conditions in this series.

Case 1 is doubtful. Since the diagnosis of pseudosclerosis had been made some years ago and since in this condition involuntary movements occur, it is possible that this case was not one of chorea, but rather pseudosclerosis. However, the condition seems to have been one of recurrent chorea which had existed intermittently since childhood, with a recurrent rheumatism, probably caused by a chronic tonsillitis and nasal sinusitis. The pregnancy was, probably, merely coincidental to the chorea, and the chronic endocarditis was one of the sequelæ often seen after nose and throat infections and after chorea.

Case 2 seems to have been a chorea of the doubtful class as to the toxicity of the condition; however, because the patient rapidly became worse after medicinal treatment, it was decided to empty the uterus before a possible fatal stage for this malady should be reached. The fact that it was necessary to keep the patient in a straight jacket for weeks, under more or less "twilight sleep," and supported mainly by means of rectal feedings, leaves little doubt as to the state of toxemia.

Case 3 had a preceding sore throat. This might have been a Sydenham's chorea, judging from a diagnosis made on the history of previous

diseases; however, the choreiform movements, plus the acute mania, and the observations of a careful observer, confirm the diagnosis of chorea insaniens.

Case 4 showed such rapid and striking improvement after the termination of the pregnancy, that it leaves little doubt that this was an instance of true chorea gravidarum.

Case 5 seemed at first to be a case of Sydenham's chorea that recurred during pregnancy, when the toxic element became more dominant. This case serves to emphasize the warning of Muehlbaum that recurrent chorea in a subsequent pregnancy renders the prognosis more grave.

Case 6 was a true chorea gravidarum occurring in the eighth month of an otherwise normal pregnancy. There was no history of any antecedent chorea or disease that might have caused the chorea. The history of three successive pregnancies, and more or less continuous lactations, might have been factors in lowering the resistance of the patient, and the nervous element, the result of her domestic difficulties, perhaps excited the acute attack. The temperature and heart findings suggest that the cause of death, eight days after delivery and after an apparent improvement, was probably endocarditis, though a blood culture failed to substantiate this.

All of these patients had an elevation of temperature ranging from 100° F. to 108° F., even those who recovered; while the elevations reached 108.8° and 109.6° F. in the two fatal cases. All had a rapid pulse, usually in the neighborhood of 110 to 120, and always out of proportion to the temperature. There was a definite history of mental anxiety and more or less nervous strain present in four of them; only one patient had a definite rheumatic history.

All patients were considered toxemic and so treated by emptying the uterus. The presence of fever, rapid pulse, choreic movements, more or less delirium, inability to take a sufficient amount of food, and the lack of improvement shown after medicinal treatment, all combined to fulfill the requirements set forth by Hellier as indications for an interruption of the pregnancy. Our practice has been to empty the uterus of all patients with chorea gravidarum where an acute onset first occurred during the pregnancy. Case 5, which resulted fatally, was an instance of Bumm's warning and was probably due to the fact that the case was considered a simple chorea of the recurrent type and the delay proved fatal. The other fatal case was also one in which considerable delay took place.

Among my six cases, there was no history of chorea in the family; the mother of Case 2 gave a history of having had an attack of nervous prostration. All six patients were between the ages of 20 and 25. The gestation periods at which the condition occurred were equally divided; two of them occurred during the first trimester, two during the second, and two during the third trimester of pregnancy.

Only one patient had had a definite attack of chorea previously, and this same individual was the only one who gave a positive history of rheumatism; a second patient, who had been thought to have had chorea before, was later diagnosticated as suffering with pseudosclerosis and might be classed as a doubtful recurrent chorea. Only one case was certainly recurrent, and this one resulted fatally.

CONCLUSIONS

From a consideration of these six cases and my review of the literature treating of chorea gravidarum, the following conclusions are reached:

Pregnancy in a choreic individual is not necessarily serious, though it may assume this character; however, an acute chorea beginning during pregnancy is always a grave affection.

A pulse rate persistently above 100 and the presence of fever, delirium, and an inability to take sufficient nourishment and rest, comprise a picture of the deepest gravity.

More attention should be given to guarding against predisposing factors. Among the needs in this connection may be mentioned the following: Proper diet, elimination, exercise without fatigue, adequate rest, and absolute freedom from extraneous worries and cares. During the puerperium, guarding against mental and physical exhaustion, improvement in nutrition and general physical condition, proper elimination, adequate rest, etc., are very important. The interests of the patient are best conserved by *early emptying* of the uterus as soon as a definite diagnosis of chorea is made. Pregnancy in the choreic individual should be treated symptomatically, and interference with gestation instituted only upon the appearance of symptoms conclusively pointing towards the severe form of chorea. Sterile blood cultures from three cases, two of which were fatal, and the rapid improvement shown after the termination of pregnancy, justify the belief that chorea gravidarum is of toxemic origin.

BIBLIOGRAPHY

[1]Williams, J. W.: Obstetrics, D. Appleton & Co., 1912, p. 507. [2]Schenkius:—Observ. Medic. rararum-Basel, 1594. [3]Bumm, E.: Grundr. z. Stud. d. Geburtsh., 1902. [4]Meyer, E.: Psychosen a. Schwagerschaft, Deutsch. med. Wchnschr., 1918, xliv, 533. [5]Kleist: Ueber Psych. Stoerungen bei Chorea Minor, Ztschr. f. Psych. 1907, p. 769 (6 Falle). [6]Muehlbaum, A.: Die Prognose bei Chorea Gravidarum; Prakt. Ergebn. d. Geburtsh. u. Gynäk., 1914, vi, 55-86. [7]Bonhoeffer, K.: Die Indikationen z. Aertzlichen Unterbrechungen d. Schwangersch. b. Psychosen und Nervösen Stoerungen, Berl. klin. Wchnschr., 1918, lv, 12, 15. [8]Wollenberg: Spez. Pathol. u. Therapie v. Nothnagel, 1899, xii, 2, 3. [9]Buist, R. C.: Chorea Gravidarum; a statist. review of the published cases; Obstet. Transac. Edinburg, 1894-95, xx, 134. [10]French, Herbert, and Hicks, H. T.: Chorea Gravidarum; The Practitioner, London, 1906, lxxvii, 178-194 [11]Wall and Andrews: Lancet, London, May 16, 1903, p. 1372; Brit. Med. Jour., Jan. 24, 1914, p.223. [12]Quigley, Wm. J.: Observations on the Bacteriology of Chorea, Jour. of Infectious Diseases; 22, 1918, p. 198-204. [13]Graves, Stuart, Paige, Beryl: The Etiology of Chorea, New York Med. Jour., Feb. 15, cix, 265.

[15]Mackey, Leonard: Brit. Med. Jour., Jan. 31, 1914, p. 277. [16]Duckworth, Sir Dyce: Observations on Chorea Gravidarum; St. Bartholomew's Hospital Reports, xxxix, 1903. [17]Sänger: Bericht ueber die 474 Sitzung d. Gesellsch. f. Geburtsh., Leipzig, Centralbl. f. Gynäk., 1899. [18]Shaw, W. F.: Jour. Obst. and Gyn. of the Brit. Empire, April, 1907, and Brit. Med. Jour., Jan. 24, 1914, p. 223. [19]Hirschl: Monatschr. f. Geburtsh. u. Gynäk., xvii, No. 1, p. 56-70. [20]Harding, G. T.: Some Graver Forms of Chorea, Ohio State Med. Jour., May, 1917, p. 320. [21]Schrock: In-Diss., Koenigsberg, 1898. [22]Fehling: Ein Fall von Chorea Gravidarum, Arch. f. Gynäk., 1874, vi, 137-139. [23]Birnbaum: Zur Aetiologie, Pathogenese und Klinik der Chorea Gravidarum, Prakt. Ergebn. d. Geburtsh. u. Gynäk., 1910, ii, p. 206-222. [24]Fellner, Otfried Otto: Die Bezieh. inn. Krankh. z.Schwangersch. Geburt. u. Wochenbett; Deuicke, Leipzig u. Wien., 1907, p. 2. [25]Martin, A.: Zur Chorea Gravidarum; Deutsche med. Wchnschr., 1906, xxxii, 1265. [26]Spiegelberg: Wiener Lehrbuch der Geburtshilfe, 1882. [27]Croft, E. O.: Treatment of Chorea Gravidarum, Brit. Med. Jour., 1910, p. 872. [28]LePage, M. C.: De la mort les Choreique pendant le grossesse, Bull. de la Soc. D'Obstet. et de Gynec. de Paris, April, 1913, p. 326. [29]Hellier, John B.: Case of Chorea Gravidarum Treated by Inducing Abortion, Lancet, London, June 20, 1913. [30]Anton: Handbuch d. Gynäk., 1910, v. [31]Horstius: Opera Medica, Nuernberg, ii, 112.

THE RADICAL CURE OF FEMORAL HERNIA

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WE feel that there are many things yet to be learned about the radical cure of femoral hernia. The old method of operation, making the incision over the tumor, attempting reduction through the ring, and closing the ring from below, has long since outlived its usefulness and is now quite inadequate. Some who are using the inguinal route in the attack upon femoral hernia have failed to grasp small but important steps which in the hands of the careful surgeon have given great satisfaction and have elevated the surgical cures of femoral hernia to almost one hundred per cent. It is these small but important refinements in the operations for the cure of femoral hernia which give permanent results. Femoral herniae are prone to complications which cannot be met by the other operative methods.

There is yet much to be said about the various elaborations of the inguinal operation which in our hands have given many excellent results in complicated as well as ordinary cases.

Anatomically the femoral ring is bounded by the following structures: externally, by external-iliac vein; anteriorly, by Poupart's ligament; internally, by Gimbernat's ligament covered by transversalis fascia; posteriorly, by Cooper's ligament.

A delicate layer of connective tissue closes the femoral ring, and is described by M. Cloquet as the septum crurale. It is a slight protection to a hernial protrusion; a small lymphatic gland usually lies between it and the peritoneum. It is perforated by numerous small openings for the passage of lymphatic vessels, and serves as much for their connection and support as for closure of the ring. Beneath this septum a layer of fatty tissue is usually found lying directly upon the peritoneum.[1]

It is easily understood from a study of the anatomy of the parts, that the femoral ring, although reenforced and protected in such a marvelous manner, must be a weak point in the abdominal wall. By congenital defect, laxity of tissue, or by long continued pressure, the peritoneal covering over the ring becomes pouched and a lodgment of abdominal contents serves as a wedge to force open the canal. The greater size of the canal in women, together with the firmer character of the inguinal ring, renders this variety of hernia more common in the female.

The tumor usually descends vertically through the canal, along the inner compartment of the sheath of the femoral vessels as far as the saphenous opening. Here the sheath is greatly narrowed and in

close contact with the vessels. The superficial fascia and the crural sheath are closely attached to the lower part of the saphenous opening and by these obstructions the tumor is prevented from extending lower. It carries before it the cribriform fascia and curves upward upon the falciform process of the fascia lata and lower part of the tendon of the external oblique muscle, retained only by the superficial fascia and integument.[2]

In our series of 403 operations for hernia, 301 are recorded by Dr. Jacobson and the writer on the surgical services of St. Vincent's Hospital and Lucas County Hospital between November 1, 1914, and December 1, 1918. The remaining 102 cases are recorded on the surgical services of the same institutions by the writer from December, 1918, to June, 1920. In these two series, 39 were femoral hernia, 29 in women, 10 in men. There were 11 strangulated femoral hernia and 7 incarcerated femoral hernia. There is one recurrence in a woman operated by the technic as described by Moschowitz.[3] Since that time we have used the technic herein described and in twenty cases there have been no recurrences.

TECHNIC

For some years our hernia operations, regardless of size or complication have been done under local anesthesia after the method of Braun with a one-half of one per cent novocaine solution with three drops of adrenaline chloride to the ounce. We have used as much as sixteen ounces of this solution in the treatment of large hernia without ill effect. The tissues are relaxed, the anatomy of the parts is easily demonstrated, and when the injection is carefully made our patients complain of absolutely no pain. The healing is in no way interfered with, and the postoperative course is tranquil and without the complications which occasionally occur following general anesthesia. It was formerly our custom to wait ten or fifteen minutes after the injection of novocaine, but at the present time we are using just enough of the solution under the line of incision to do away with the necessity of waiting and after the injection is completed we are able to proceed without difficulty. The superficial areas are completely blocked off by a diamond-shaped injection, and the fascia located with the point of the needle and an ample amount of the solution injected under the fascia and along the cord as in inguinal hernia. It is also well in femoral hernia to inject downward over the tumor in case it should be necessary to carry the incision onto the thigh. The incision is made about five inches in length parallel to Poupart's ligament, care being taken at no time to exceed the field of anesthesia. Having carried the incision through the skin, fat and superficial fascia, consideration is then given to hemostasis at this point of the operation, since we feel that any bleeding in the wound after closure will interfere with good union

and will encourage infection, and the use of adrenaline in the novocaine solution is liable to mask hemorrhage which in itself will not be serious but might interfere with the course of healing. A dry field is very important. The external oblique fascia is divided in the direction of its fibers and by blunt dissection the internal oblique above and Poupart's below are brought into view, care being taken that both of these structures are freed of any fascia, connective tissue or fat well above and well below the incision. Caution at this point will result in better union when the anatomical repair is made.

The ileoinguinal nerve is carefully preserved and retracted away from the operative field. At this point the technic varies from the ordinary repair of inguinal hernia. The internal oblique muscle is retracted upwards and traction is made in a downward direction upon Poupart's ligament. Gauze dissection with the index finger is necessary at times to bring into view the peritoneum, the hernial sac and the upper aspect of the crural ring. It may also be necessary at this time to dissect up the skin below Poupart's ligament over the hernia, freeing the hernial sac; if this is necessary the injection of novocaine previously mentioned will render the procedure easy and painless. We now inject the neck of the sac, which eliminates pain when traction is made. A curved hemostat is passed through the femoral ring from above along the hernial sac which is grasped at its lower end and pulled upward through the crural ring. In complicated cases where there is strangulation this may be impossible without first dividing the crural ring. This is done from above downwards when necessary and all structures are cleanly divided to reduce the obstruction. Repair of the crural ring and of Poupart's ligament is not always easy but can always be accomplished, and the procedure in no way interferes with the postoperative course or with the sound and firm healing of the wound. In uncomplicated cases the hernial sac is simply retracted through the femoral ring and the hernia converted into an inguinal hernia, the sac is opened and ligated as high as possible with No. 3 iodine catgut. Cooper's ligament which runs from the pubes to the ileopectineal line in a direction not quite parallel to Poupart's is cleanly exposed. This ligament lies above and slightly posterior to Poupart's ligament and anatomically is part of the transversalis tendon.[4] It is so situated that sutures from above downward through Cooper's ligament picking up the fibers of Poupart's ligament will close the femoral ring in most subjects. We use fine kangaroo tendon on a round needle with two or three sutures as the case may require.

We then proceed with our technic for the cure of inguinal hernia using kangaroo tendon on a round needle. Interrupted sutures are placed from above downwards, the first suture at the lower angle passing through the conjoined tendon and Poupart's ligament at its junction with the pubes. The second suture passes through the conjoined ten-

don and Poupart's ligament. The succeeding sutures of kangaroo tendon are then passed from above downward through the internal oblique and through Poupart's ligament, these latter sutures being placed high up, through muscle fibers of the internal oblique. When these sutures are tied the internal oblique muscle is "rolled" against Poupart's ligament and against the upper opening of the crural ring closing the upper aperture of the crural canal and making this opening inaccessible to any peritoneal process. We believe the suturing of Cooper's ligament to Poupart's, as before described, to be important,[5] but think that the sutures placed through the internal oblique high up, rolling this muscle well against Poupart's, are perhaps the most important sutures in the repair of femoral hernia. There are cases where the suturing of Cooper's to Poupart's ligament does not close the crural ring. The rolling of the internal oblique muscle against the femoral ring and against Poupart's ligament with kangaroo tendon as described will close the ring and eradicate the possibility of recurrence. The outer flap of the external oblique fascia is then sutured to the internal oblique muscle with interrupted sutures of No. 2 Chromic. The inner flap of the external oblique fascia is overlapped and sutured with fine kangaroo tendon to Poupart's ligament. This procedure renders the abdominal wall firm and strong. If the internal oblique muscle and Poupart's ligament are dissected clean, there will be no question of sound healing.

We believe that kangaroo tendon is superior to any other suture used in the repair of hernia, as it remains in the wound much longer, will withstand whatever strain may be placed upon it due to the altered anatomic position of the muscles and will maintain this position for a long period to insure healing. In event of infection, which sometimes occurs, kangaroo tendon is a friend in need. We have demonstrated to our own satisfaction that infected hernia incisions which are sutured with kangaroo tendon will hold despite the infection.

If during the course of operation it is necessary to cut the crural ring or Poupart's ligament to reduce strangulated bowel or omentum, the repair is made immediately succeeding the closure of the hernial sac. We have found this necessary in several cases where there was a large amount of strangulated bowel and where resection was necessary. In these cases, using novocaine alone injected into the mesentery, we have performed resection of the bowel and lateral anastomosis without difficulty and without discomfort to the patient. The inguinal route is certainly the only method to use in the surgical treatment of complicated femoral hernia. Succeeding the anatomic repair as described interrupted silkworm gut sutures are passed through the skin and superficial fat on each side of the incision, three or four being usually necessary. Skin clamps are used to approximate the skin.

CONCLUSIONS

1. There are recurrences following the operative correction of femoral hernia.

2. The older methods are quite inadequate.

3. The inguinal route as herein described has proved most efficient in our hands and offers a higher percentage of cures.

4. Sutures through the internal oblique high up "rolling" the muscle against Poupart's ligament securely repairs the deficiency, reenforces and protects the sutures through Cooper's ligament to Poupart's ligament.

5. Novocaine is the anesthetic of choice, there is better relaxation of the parts and any amount can be used.

6. Kangaroo tendon due to its longevity is the best suture material for operative procedure in hernia.

REFERENCES

(1) Henry Marcy: Anatomy and Surgical Treatment of Hernia, 1892, p. 120. (2) Henry Marcy: Anatomy and Surgical Treatment of Hernia, 1892, p. 122. (3) Moschowitz, A.: New York State Jour. Med., October, 1907, p. 396. (4) McClellan, George: Regional Anatomy, 1892, ii, p. 14. (5) Seelig and Tuholske: Surg., Gynec. and Obst., 1914, xviii, p. 55.

CHOLECYSTOGASTROSTOMY AND CHOLECYSTODUODENOSTOMY

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THE internal drainage of the gall bladder by an anastomotic operation between the gall bladder and intestine was first performed by Winiwarter as a two-stage operation, the first successful cholecystoduodenostomy being credited to Terrier. With the introduction of the Murphy button in 1892, the operation acquired a transient popularity, the anastomosis being made to the stomach, duodenum, small intestine, or colon as was found convenient by the operator. Ill effects from technical errors and indiscriminate methods of anastomosis were observed and for many years the method has received comparatively little attention from surgeons. It is our impression that with the present development of satisfactory methods of intraabdominal anastomosis by suture, the operation has advantages that should give it a very prominent place in biliary surgery. Each year many reoperations are made necessary, many lives lost, because the surgeon in operating on the biliary system has not efficiently provided for the drainage of bile into the alimentary tract. The chief danger, that of an ascending infection of the biliary tract, is probably not very much greater after a well performed anastomosis than after a cholecystostomy. In about 130 anastomoses of the gall bladder performed by my associates and myself during the past four years, we have seen no case of secondary ascending infection of the biliary system.

Apart from the value of the anastomosis in the treatment of diseases of the biliary system, we wish to direct attention to the possible helpful influence of these drainage operations upon certain disorders of the stomach and upper intestines. Contrary to conventional opinion, bile is a normal fluid in the stomach and plays an important but poorly recognized part in gastric digestion. Its entrance into the stomach does not produce nausea or discomfort, but is associated with the cessation of gastric digestion and the arrest of motor activity of the stomach. Thus at the completion of each period of gastric digestion the pylorus normally relaxes, bile flows into the stomach and neutralizes and permanently arrests the activity of the acid pepsin in the chyme. The antrum of the stomach which has felt the brunt of the irritation of gastric digestion is coated with a protective film of the alkaline mucilaginous fluid, and the peristaltic movements of the stomach cease. We would term bile, therefore, the normal resting medium of the stomach. Were the action of the bile other than soothing, its normal presence in the

stomach would not so uniformly coincide with the resting period of the organ.

Even in gastric disturbance with nausea and vomiting, the pylorus relaxes and bile pours into the stomach until the entire organ is coated and bile is ejected from the mouth. From the nauseous taste of the vomit, it is a common concept that the bile has disturbed the stomach, but it is much more logical to believe that the regurgitation of bile is a protective mechanism of nature, serving to neutralize the offending gastric contents and to soothe and quiet the irritated walls of the stomach. Blue litmus paper having been dipped in bile is more slowly and less intensely acted upon by acid chyme than the uncoated paper. In the duodenum and jejunum the protective influence of the bile and pancreatic juice is shown by many observations. Ulcers of upper intestine are exceedingly rare, except in the first portion of the duodenum, where there is the least opportunity for the neutralization of the chyme by the bile and pancreatic juice. If by operation, however, we reduce or eliminate the protective influence of the bile and pancreatic juice against the chyme in the duodenum and jejunum, ulceration becomes common.

Exclusive of nonabsorbable suture sinuses, gastrojejunostomy is followed by ulcer of the jejunum in about 2 per cent of the cases. When the bile and pancreatic juice are diverted from a segment of the jejunum, as by the Roux gastroenterostomy, the percentage of secondary ulcers greatly increases. In six out of seven dogs in which Exalto anastomosed the jejunum with the stomach after diverting the duodenal fluids in the colon, jejunal ulcers occurred. It is said that unlike gastrojejunostomy, gastroduodenostomy is not followed by duodenal ulcer. If the bile and pancreatic ducts are transplanted from the duodenum to the upper jejunum by operation, ulcers of the duodenum frequently follow. Therefore, whenever chyme from the stomach enters the upper intestinal tract without sufficient admixture with the bile and pancreatic juices, ulcers are prone to develop and there can be little question that the latter fluids normally protect the duodenum and jejunum from ulceration. As to the exact elements that cause the ulceration, free hydrochloric acid, acid pepsin, toxins in solution, bacteria or other agents; and the precise protective elements in the duodenal fluids, alkalies, mucus, nucleoalbumin, or other substance, we will not brook unproductive dispute by attempting to name. As surgeons, we think it unnecessary to enter the controversy as to whether or not peptic ulcers depend chiefly upon the hydrochloric acid content of the gastric juice. With such complex fluids it is unnecessary to assume that a single element is entirely responsible for any particular activity. Bread is equally nourishing to the man who does not fully understand its composition, and bile may serve the surgeon not versed

in its chemistry. It is important to know, however, that the so-called "peptic ulcers" have a geographical incidence corresponding to areas where the most active chyme has had the least admixture with the duodenal juices, and furthermore, that the operations that have best stood the test of experience in relieving these ulcers (gastroenterostomy, Finney pylorectomy) are those that best permit the access of duodenal contents to the area of ulceration. The drainage function of the new opening is often negligible. Moreover it is a striking fact that the efficiency of gastroenterostomy for ulcer shows a close relationship with the ease of access of the duodenal juices to the ulcerated area produced by the operation. Thus ulcers that lie out of the path of the fluids passing from the new stoma along the wall of the stomach to the duodenum, such as ulcers of the lesser curvature, in a much larger proportion of cases fail to heal after the operation, than ulcers about the pylorus. If it be true that it is chiefly the protective film of bile covering the mucosa that permits the average ulcer to heal, then we would suggest that the simple anastomosis of the gall bladder into the area of ulceration or into the area left after excision of the ulcer (cholecystoulcerostomy) be substituted for the more formidable and difficult gastroenterostomy.

The advantage of such an operation lies not merely in the greater accessibility of structures to be anastomosed, but in the fact that the bile is directly delivered to the part where it is most needed, while the dangers of a secondary jejunal ulcer or the other complications of a gastroenterostomy are avoided. The continuous entrance of bile into the stomach does not necessarily produce symptoms. In Moynihan's case the jejunum, which had been lacerated by a gunshot wound, was closed and a gastroenterostomy done, and although all of the bile and pancreatic juice had to pass through the pylorus into the stomach then out through the new stoma, the boy developed normally and had no symptoms of indigestion. Patients who have had cholecystogastrostomy performed seem to be unconscious of the increased quantity of bile in the stomach. While the bile entering the stomach after a cholecystogastrostomy reduces the total acidity, it does not abolish gastric digestion by completely neutralizing the chyme. Although acid chyme is completely neutralized in the duodenum, Dunn's experiments show that the entrance of all the bile and pancreatic juice into the stomach will not completely alkalinize the gastric contents. Of course, the surgeon aims to protect only the irritated areas of mucosa, not to completely alter the chemistry of gastric digestion. Fortunately the normal tendency for the gastric contects to remain in well defined strata and for fluids entering from new openings to diffuse along mucous surfaces is of aid to the surgeon.

Does chyme enter the gall bladder after the anastomosis? Apparently not usually, for roentgenologic studies made in several of our

patients have shown no barium entering the new opening, although a large stoma had been made. In one patient reopened by Dr. Steel the gall bladder was found transformed to a narrow duct leading from the groove in the liver to the point of anastomosis.

While in some of the first operations an attempt was made to produce a valve which would prevent the entrance of gastric fluids into the gall bladder, this is now considered unnecessary, and we simply make a large opening with no attempt at valve formation.

Contrasting the postoperative symptoms following the internal anastomosis with those of cholecystectomy or cholecystostomy, we have been impressed in our small series by the easier convalescence, and the relative freedom from secondary symptoms after the internal anastomosis.

PHYSIOLOGY

Normally from 500 to 800 c.c. of bile passes into the duodenum daily. The flow of bile is stimulated by the presence of hydrochloric acid in the duodenum and by the absorption of secretin and peptone from the upper bowel. Each gush of acid chyme into the duodenum excites a reflex closure of the pylorus continuing until the ejected portion of chyme has been neutralized (Cannon), and probably also associated with an increased flow of bile due to a reflex contraction of the gall bladder and a relaxation of the sphincter of the common bile duct. The acid pepsin of the chyme on being neutralized is permanently inactivated. The bile also precipitates the proteins held in acid solution in the chyme.

INDICATIONS FOR CHOLECYSTIC ANASTOMOSIS

1. *In obstruction of the common or cystic duct that cannot safely be overcome by other methods.* Thus with a stone impacted in the duodenal portion of the common bile duct in an obese or aged person, the anastomosis is often much safer than the removal of the stone. Toxic patients with a purulent cholecystitis and a stone impacted in the cystic ducts after the manipulation and sudden relief of pressure attending the removal of the stone often develop a lethargic febrile condition and die. We believe that some of these patients may be saved by doing a simple anastomosis and letting the stone gradually and spontaneously work its way out through the new opening. The stomach seems to be well able to take care of the products of an infected gall bladder.

2. *In cholelithiasis when a secondary postoperative obstruction is feared.* In such a case the anastomosis provides a by-pass preventing secondary obstructive symptoms. Whenever the surgeon thinks there are residual or overlooked stones in the hepatic or common ducts the anastomotic operation is the preferable procedure to employ. Whenever continuous external drainage of bile is feared from a cholecystostomy the

anastomotic operation should be performed. It is our experience that patients who have lost all their bile through an external fistula for months are very bad operative risks.

3. *In case of jaundice when the cause of the jaundice cannot be located or at least cannot be removed.* Thus in cancer of the head of the pancreas, the operation is a palliative one. One of our patients with Hanot's cirrhosis of the liver has been relieved of the intense jaundice and other symptoms for three years following the operation.

4. *In perforation of the gall bladder when there is reason for not doing a cholecystectomy, or cholecystostomy.* The operation is safer than a suture of the opening and the convalescence more rapid than after a cholecystostomy.

5. *To avoid external drainage.* Thus with gall stones found accidentally in the course of an operation upon the stomach or abdominal wall where an external drainage would complicate the operation, the internal anastomosis has advantages.

6. *In perforated gastric or duodenal ulcer.* The gall bladder may be anastomosed over the perforation without constricting the lumen of the pylorus or duodenum, and the bile passing over the ulcerated surface may protect the ulcer, facilitate healing, and prevent recurrence and so render additional gastroenterostomy unnecessary. This operation has been carried out successfully in a single case by my associate Dr. Bower. In one case of severe recurrent bleeding from a gastric ulcer the hemorrhage ceased after the anastomosis.

7. *In gastric or duodenal ulcers a "cholecystoulcerostomy" or anastomosis between the gall bladder and the ulcerated area may be performed to permit healing and to prevent recurrence of the ulcer.* We have used the anastomosis to protect the suture line and prevent recurrence of the ulcer after a Finney pyloroplasty, a coat-sleeve resection of the stomach and after the simple excision of the ulcer. Our experience with 13 gastric and duodenal ulcers is too limited and too recent to be a basis for any dogmatic conclusion. We hope the value of the operation may be shown by a large experience.

The infrequency of carcinoma in alkalinized portions of the intestinal tract suggests that the anastomosis may be a possible prophylactic measure.

8. *In very obstinate hyperacidity and pylorospasm.* A cholecystogastrostomy may be considered if no definite causal factor is found.

TECHNIC

The anastomosis of the gall bladder with the stomach is easier than an anastomosis between the gall bladder and the duodenum. The anastomosis should not be performed with the colon or other bacteria-laden portions of the intestinal tract. The operation is readily done under local anesthesia and may be carried out with very little intraabdominal

traumatism or manipulation. As a rule the gall bladder is not separated from the liver and the anastomosis is made across the posterior portion of the fundus of the gall bladder. Upon the stomach the incision is usually begun two or three centimeters proximal to the pylorus and passes in a longitudinal direction across the anterior face of the antrum a short distance below the upper border of the stomach. The lines of the anastomosis having been decided, two guide sutures are introduced from two to five centimeters apart, to mark the limits and the direction of the necessary incisions. By traction upon the two guide sutures a fold of stomach and gall bladder is pulled into the wound, and with a 00 or 000 chromic catgut suture, the posterior or upper serous suture is introduced as in a gastroenterostomy. The gall bladder is then aspirated and opened on a line at least one centimeter distant from the first line of suture. A corresponding opening is then made in the stomach. The mucous surfaces are carefully united by a continuous suture of 0 or 00 chromic catgut which is continued entirely around the opening as in a gastroenterostomy. Clamps are unnecessary. All points of bleeding are carefully controlled and in some cases a third row of sutures is used to unite the muscular layers. The serous suture is then completed anterior to the opening, and if necessary several additional supporting sutures are applied. It is very important that the outer sutures do not penetrate the gall bladder. The omentum is usually laid over the line of anastomosis and the wound closed without drainage. In no case have we had secondary intraabdominal leakage of bile.

RESULTS

In about 60 personal cases of cholecystogastrostomy and cholecystoduodenostomy there have been six deaths. Two deaths occurred from associated myocardial disease, one from acute necrotic pancreatitis for which the operation had been performed, one was from an associated advanced pulmonary tuberculosis, one from cholemia from a very septic gall bladder, and one in a case of chronic nonobstructive jaundice, after reoperation for secondary hemorrhages from the stomach or intestine.

No death occurred in any uncomplicated case. Two of the patients were over 70 years of age, several were over 60, a number had purulent forms of cholecystitis, two had pancreatitis, while thirteen had chronic ulcers of the stomach or duodenum. Our experience is too meager to contrast results with those from gastroenterostomy.

The ease of the procedure, the usual rapid convalescence, freedom from complications, and relief from symptoms, should, we believe, encourage a wider trial of the operation.

BENIGN TUMORS OF THE LABIA

By William H. Condit, M.D., F.A.C.S., Minneapolis, Minn.

THE vulva may at any time become the seat of neoplasms, but they are quite rare, however, when compared with the frequent occurrence of tumorous growths in other areas of the urogenital tract of the female. It is exceptional to encounter tumors of the labia minora; only a very few are reported in the literature. The majority of these growths are confined to the labia majora. The cyst is without question the most frequent tumor met with in this region and usually arises from the bartholin duct or gland, primarily caused by infection, trauma, or simple hypertrophy of the gland. They also may originate from hemorrhages into the gland or duct forming primarily a hematoma, which later undergoes a cystic degeneration. Dermoid cysts may occur in this locality, but are exceedingly rare. Fibrous growths are second in frequency; lipomatous, malignant, myxomatous and leiomyomatous tumors occur in frequency of order named.

The series herein reported occurred in the writer's practice in the period of one year, which may be considered unusual and unique and of sufficient interest to warrant reporting in detail.

CYSTS OF THE LABIA

Sebaceous cysts of the labia majora and minora are not uncommon. Occasionally thin-walled pedunculated cysts are met with containing a clear fluid. They probably represent distended odoriferous (Tyson's) glands.

Cystic tumors of the labia majora are usually retention cysts of the bartholin gland or duct due to obstruction, of inflammatory origin in the duct. The tumor may be confined to the duct, provided the site of the obstruction is near the orifice. This is the most common variety, and usually the result of neisserian infection. If the obstruction occurs in the duct near its junction with the gland, the glandular structure may become involved, usually resulting in the total destruction of the glandular tissue. The condition may be bilateral. The patient usually complains of pain, especially aggravated at the menstrual period. The swelling may subside between the periods and gradually grows larger with the repeated distentions. During sexual intercourse dyspareunia usually results. The tumors may rupture spontaneously, but recur if the cystic sac is not removed. The contents of the cyst may be watery, viscid, purulent, or hemorrhagic, or any combination of the above fluids.

PATHOLOGY

The wall of the cyst is usually thin, lined with one or more layers of squamous epithelium; some degenerated gland tissue may be found flattened out on one side of the cyst. If the gland itself is cystic, the wall will consist of connective tissue and is lined with cylindrical cells. In the case here reported, the cyst was of many years' standing and had a hypertrophied layer of skin over the cyst, the wall was of thickened connective tissue, lined with squamous epithelium and the contents a chocolate-colored viscid hemorrhagic fluid.

CASE I.—White, age thirty-two, widow, nullipara. The patient had never suffered from any severe illness; had had no temperature at any time. Ten years ago

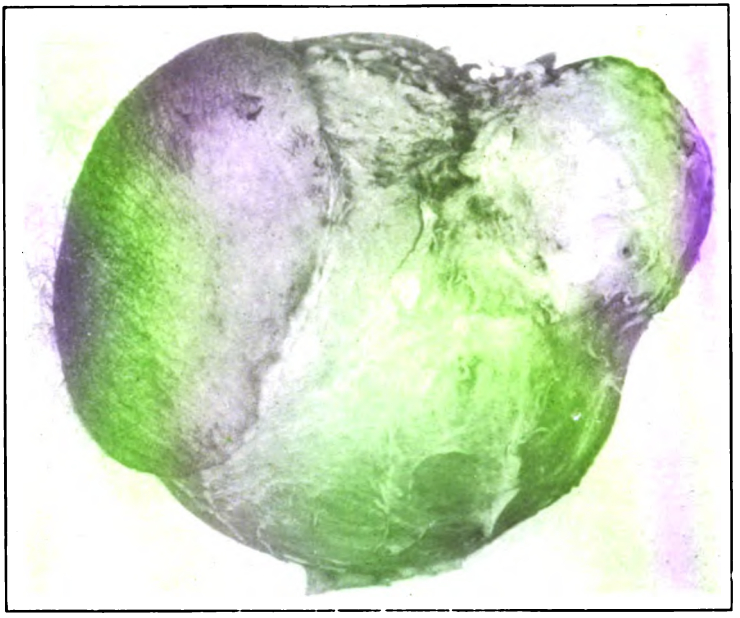

Fig. 1.—Cyst of the labium, Case 1. The cyst was 13.5 by 8.5 centimeters in diameter.

she was infected with gonorrhea, but did not follow medical advice or treatment. One year following the acute infection, she noted a swelling of the left labia, the size of a walnut. The tumor gave little inconvenience for several years, but the past three years has been growing rapidly. The patient consulted me because of the mechanical inconvenience of the growth, as it interfered with walking, urination, and cleanliness of the parts. The tumor appeared pedunculated, measured 13.5 by 8.2 centimeters, and was covered with skin with quite a marked growth of hair (Fig. 1). On removal of the cyst, large cavernous vessels were encountered and in depth the cyst extended to the deep fascia of the pubic arch, tapering inward to almost a point, having the appearance of a pear with a slight neck or constriction, 5 centimeters from the tip.

Operation.—Local anesthesia was employed in the dissection. Infiltration of the superficial tissues was made using 0.25 per cent cocaine hydrochlorate solution. Two elliptical lines of infiltration beginning at the upper pole of the tumor and extend-

ing to the lower pole were made, as it was necessary to remove a large area of the skin covering the tumor. Blunt dissection easily relieved the tumor mass from the surrounding tissue. Some difficulty was experienced in controlling hemorrhage at the base of the tumor as there were many tortuous large vessels close to the periosteum of the pelvic bone. Healing was rapid and uncomplicated and a fairly good labium was left.

FIBROMA OF THE LABIA

Fibrous growths of the labia while rather uncommon are next to the cyst in frequency of occurrence, and are the most frequent of the benign, solid neoplasms met with in this area of the female genitalia. These tumors may undego a cystic degeneration if neglected, for as the process of growth advances, circulatory impairment results, the tumor becomes edematous, semifluctuating and undergoes a cystic degeneration as in the uterus. This tumor, like the retention cyst of the bartholin gland, is subject to the influences of the menstrual period; showing an increase in size, pain, and becoming hemorrhagic. In the event of pregnancy, the tumor usually shows the same changes, but in addition may take on a very rapid growth. V. N. Leonard reports 12 cases with an excellent digest of the literature and an exhaustive bibliography. Because of an accident to the fibrous tumor of this group after removal, it was impossible to secure photographs or pathological material for study; hence it will receive but passing mention with the case history. This tumor was causing no physical or pathological symptoms and on removal proved, macroscopically, a simple fibroma. The exact tissue fostering this growth was not determined, but doubtless was from fibrous hyperplasia about the bartholin gland.

Leonard says: "Tumors of this region may attain greater dimentions than superficial fibromata in any other parts of the body." As a rule they grow rapidly and become pedunculated early. Many of them show some form of degenerative change. The subperitoneal fibromata, which originate in the pelvic connective tissue and grow along lines of least resistance, first appear at the vulva and are the largest tumors on record. The largest described weighed 268 pounds. (Buckner, Whitney, and Harrington). Two-thirds of the fibroids of the vulva originate in the subcutaneous connective tissue, one-third in the extraperitoneal portion of the round ligament.

CASE 2.—White, age thirty, married nullipara. The patient was operated upon seven years ago by the writer for bilateral salpingitis and oophoritis, the pathologic condition requiring the removal of all the adnexa except a part of one ovary. The above condition had been the result of an infection of long standing, accompanied by a chronic endometritis and metritis, associated with a chronic profuse vaginal discharge which caused more or less irritation about the vulva. Four years after the laparotomy, the patient noticed a small swelling of the left labia. The tumor caused little inconvenience; hence was neglected. The patient was experiencing her regular menstrual periods, which, however, became gradually diminished in quantity. As amenorrhea developed, this tumor began to grow quite rapidly and fearing malignant

degeneration, the patient consulted me for removal of the growth, which at this time had attained the size of a large hen's egg.

Operation.—The tumor was excised, local anesthesia being used. No complications attended the operation or recovery.

LIPOMA OF LABIA

This is one of the rarest of gynecologic affections. In Kelly's monograph published in 1906 are noted but 20 cases from scattered sources. To that date he had had but one in his own clinic which was the smallest tumor of the above series measuring 2 by 1.5 by 1 centimeter. The largest was reported by Headley (Melbourne), weighing 24 pounds. Only two labial lipoma have been found in the Mayo Clinic in the last 127,000 cases passing through the clinic. J. B. Murphy reports one case in 1916. Goodsell, of Philadelphia, reported a case in 1887, which grew

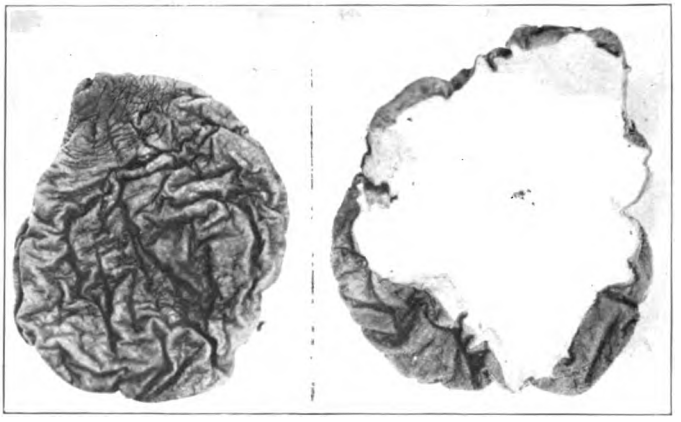

Fig. 2.—At left external view of pedunculated lipoma of the labium majorum; at right, cut surface of tumor of Case 4.

from a long broad pedicle, and extended to the patient's knees. Sturmdorf reported a case in 1909, in which the tumor had attained the unusual size of 12.5 by 10.5 centimeters in circumference. This patient was in the first stage of labor and the tumor was arresting the progress of the fetal head. The growth was on the left labium majorum and delivery was further complicated by an ankylosis of the right hip-joint. The tumor was excised and labor successfully terminated. Lipoma of the labia majora presents the same characteristics as lipoma elsewhere in the body. They may project from a broad base involving the whole labia, as in Case 3, or the growth may be suspended by a more or less attenuated pedicle, as occurred in Case 4. These tumors may be readily mistaken for cysts, elephantiasis, hernia, varicocele, and fibroma. The tumor may vary in size, from that of a walnut to the 24-pound tumor reported by Headley, depending upon length of time and rapidity of growth. The microscopic pathology is the same as in any lipoma.

CASE 3.—Mrs. F. S., age twenty-six, American, weight 182 pounds. The patient was admitted to the hospital for operation on December 26. The history was negative for fever or other illness. Menstruation began at the age of 11 years and has always been regular and normal. The first pregnancy, at age of 18, terminated at full term. Labor lasted 52 hours and a female child weighing eight and one-half pounds was delivered by forceps. The child died at one month, supposedly due to brain injury at delivery. The patient has had two criminal abortions since delivery of her first child. The patient consulted me for a tumor of the left labium, the size and shape of a large banana. She first noticed the tumor four years ago, but it had grown rapidly the past two years. It was not pedunculated or markedly lobulated. There was also a marked relaxation of the pelvic floor, a result of a laceration at the time of the forceps delivery 8 years previously.

Operation.—The lipoma was resected and the pelvic floor repaired under general anesthesia. Convalescence was uninterrupted.

CASE 4.—Mrs. W. O., age thirty-eight, American Indian, married and had two grown daughters. Absence of any interpreter made it impossible to secure detailed history. The patient, suffering from incontinence of urine, was sent to the hospital from the Indian Reservation on February 28, 1918. The external genitalia were normal, except for the pedunculated lipoma springing from the left labium majorum. The genital parts and upper thighs were bathed in urinary secretion, rather foul, which had caused a marked dermatitis. Vaginal examination revealed advanced inoperable carcinoma of the pelvic viscera, which had caused two large vesico-vaginal fistulæ. The patient died in two months in the State Hospital; no postmortem report was received.

Operation.—The lipoma was ligated with a silk ligature and removed; the pedicle was very small and the tumor symmetrical, but lobulated as shown in Fig. 2.

MYXOMA OF LABIA

These tumors are composed of a loose connective tissue with branched cells widely separated by viscid, opalescent, mucoid substance which actually contains mucin. On the whole, myxomata are rare, as the type of tissue of these tumors exists only in the Wharton's jelly of the umbilical cord, which stands as the prototype of the myxomata. They are found in various situations in the body; e. g., in subcutaneous and intermuscular tissues, in connection with tendons, periosteum, joints, and especially the heart. In most instances myxomata are benign, but occasionally they may show signs of malignancy, invade widely, and even metastasize to other organs. One form of myxomatous tumor, which may attain the size of a cocoanut, is found in great nodular masses in the retroperitoneal region at the root of the mesentery. The masses are encapsulated and tend to recur after removal. Virchow distinguished different subdivisions of myxoma.

1. Myxoma gelatinosum, largely made up of homogenous intercellular substance.

2. Myxoma fibrosum—characterized by great development of intercellular substance.

3. Myxoma medullary—where we have an increase of its cellular elements and forming the transition to the corresponding cellular form of tumor known as myxosarcoma.

4. Myxoma cavernosum—containing many cavernous blood-vessels.
5. Myxoma telangectaticum—rich in capillaries.

CASE 5.—Mrs. H. I., nullipara, age thirty-four, Swedish, weight 180 pounds; admitted to the University Hospital, February 10, 1918. The patient had been operated upon seven years previously for appendicitis. Appendectomy gave permanent relief from pain which the patient suffered for a year. Menstruation began at the age of fourteen, and was regular and normal, up to the past four years when the flow became rather scanty and was accompanied by pain. The patient complained of abdominal pain, dysmenorrhea, and a tumor of the right labium majorum which had been diagnosed as an inguinal hernia.

Operation, by J. L. Rothrock of St. Paul, to whom the author is indebted for the specimen, the case occurring in our department clinic, University of Minnesota. A

Fig. 3.—Photograph of myxoma; Case 5.

midline incision was made through the scar of a ventral hernia repair, which was done seven years previously at the time of the appendectomy. There were no adhesions of the abdominal viscera; the uterus was retroverted in third degree; there were firm adhesions of the left tube and ovary; chronic salpingitis and oophoritis. Left salpingectomy and oophorectomy were done. A suspension operation was not indicated. Thorough examination of the lower abdominal cavity was made to make sure the labial tumor did not originate from some abdominal viscera (for even an obturator hernia was considered), but no such opening or hernia was present. An incision was then made in the labium and dissection of the tumor begun. The mass extended from a point at the level of the vaginal orifice in the direction of and to the ischial tuberosity. The tumor on dissection reminded one in appearance and texture of a testicle and hypertrophied cord and epididymis. (Fig. 3.) The tumor was 26 centimeters long, was not pedunculated, loosely surrounded by soft fatty tissue, scant in blood vessels, and had two diverticulum-like processes. Distinct cystic

spaces were found in the diverticulum, but contained no fluid. The tumor proved to be a myxoma. The true origin of the tumor is only speculative.

Pathology.—Microscopic specimens show the classical histology of myxomatous tissue as found in the umbilical cord, namely loose connective tissue cells widely separated by a viscid, opalescent, mucoid substance. (Fig. 4.)

Fig. 4.—Photomicrograph of myxoma shown in Fig. 3, Case 5.

LEIOMYOMATA

These tumors, also known as myoma levicellulare, are of a very simple structure, growing from smooth muscle fibers and most common in the uterus, ovary, and gastrointestinal tract. Less commonly they occur in the bladder, blood vessels, skin, and nipples.

Leiomyomata are usually rounded growths, varying in size from minute nodules to solid masses weighing 60 to 70 pounds. They are surrounded by a capsule, which is well defined and more or less hard. In whatever location, they spring from pre-existing unstriped muscle fibers. Microscopically, we find bundles of muscle cells running in different directions. Cut longitudinally they show cylindrical nuclei as the most conspicuous feature. Lying between the muscle cells are collagen and so-called myoglia fibrils. The latter appear as coarse lines along the sides of the cells. Usually some fibrous cells are found in these tumors. The tumor herein pictured evidently arose from some small unstriped muscle fibers of the duct of Bartholin, and is of interest only from its location.

Stevens reports a case of rhabdomyoma (striped muscle tumor) of the vulva. The diagnosis might be questioned, however, as Johnson, Bland-Sutton and others contend that a tumor composed entirely of transversely striated muscular tissue has not yet been described and it is probable that certain elongated and transversely striated cells occasionally met with are not really muscle fibers. Striated muscle fibers

are, however, sometimes present in mixed tumors of the kidney and the testicle, occurring in early life.

CASE 6.—Mrs. W., age thirty-six, weight 200 pounds, born in Roumania, married 8 years, and has had no pregnancy by present wedlock. She claims never to have been pregnant, but marked laceration of the cervix uteri and of the pelvic floor suggests an early pregnancy, doubtless out of wedlock. The history is negative for fevers or illness. The chief complaint is a profuse vaginal discharge. She was treated locally for several weeks for the leucorrhea, which resisted all efforts to relieve it. The tumor of the right labium minora was noted and diagnosed a cyst of the bartholin gland and naturally considered of neisserian origin as also was the cervicitis and endometritis. The patient was curetted and the tumor of the labium removed.

Pathology.—Microscopic findings revealed a cystic hypertrophic endometritis and a leiomyoma of the labium. The tumor doubtless originated from the unstriped muscle fibers of the duct of bartholin. Microscopically one notes bundles of muscle

Fig. 5.—Photomicrograph from a section of a leiomyoma of the labium, Case 6.

cells running in different directions. The cells cut longitudinally show cylindrical nuclei as the most conspicuous feature. Proper staining may show a substance known as collagen and myoglia fibrils, the latter appearing as coarse lines along the sides of the cell (Fig. 5).

Proper and Simpson, of the pathological laboratory of the New York State Institute for the Study of Malignant Diseases, reports that malignant leiomyomata are not uncommon and may be defined as malignant neoplasms arising from mesoblastic cells of the smooth muscle type. It is conceivable that these tumors may originate from either adult, smooth muscle cells or from benign tumor cells as found in leiomyomata. The latter origin must be considered as the common one on account of the frequency with which a history of "degenerating fibroid" accompanies these tumors.

Virchow, in his treatise on tumors, described in 1863 a myoma of the stomach which underwent a metaplasia to myosarcoma. While he speaks

about its originating in the interstitial tissues, still his microscopic description of the cells and especially the nuclei leads one to believe that he had to deal with a true malignant leiomyoma to which he gave a name of myosarcoma. Ritter describes a case of large fibromyoma of the uterus which showed sarcomatous changes at the center and to which he gave the name myosarcoma. Von Kahlden reviews the literature and, after describing many reported cases, some of which were probably cases of true sarcoma as well as malignant leiomyomata, he describes a personal case which is of especial interest because he claims one can demonstrate histologically a direct transition of a fibromyoma to a sarcoma. Williams, after a careful study, does not see how von Kahlden can exclude the possibility of the sarcoma cells springing from the interstitial connective tissue, although he himself described a case in the sections of which he could demonstrate an actual transition of myoma cells to sarcoma cells. Almost all authors of this period speak of these tumors as myosarcoma, but as Ribbert points out, the name sarcoma should be reserved for malignant tumors springing from connective tissue. For the smooth muscle tumor which has undergone malignant change he suggests the name of malignant myoma; and he would only use the term myosarcoma for the extremely rare cases when true sarcoma and myoma exist at the same time producing a mixed tumor. Ribbert also emphasizes the fact that the term malignant degeneration of the "fibroid" is improper usage inasmuch as a tumor is not a regressive, but distinctly a progressive process. Much discussion has arisen regarding the best terminology to designate these tumors arising from the smooth muscle type of cell. Mallory would include all tumors both benign and malignant which are composed of the smooth muscle cell type under the general term leiomyoblastoma. Williams prefers the term myomasarcomatodes because it signifies a sarcoma-like tumor which springs from the muscle cells of a myoma. Aschoff, Kauffmann, and Hertzler use the term myosarcoma, while MacCallum prefers the term malignant myoma. It would seem most rational to use the term suggested by Morpurgo, and also used by Ghon, viz., malignant leiomyoma, as this covers the ground and instantly shows one that we are dealing with a malignant tumor comprised of the muscle type of cell.

BIBLIOGRAPHY

Adami: Montreal Med. Jour., xxv, 529. Aumonie: Thesis de doct., Paris, 1876. Bell: Jour. Obst. and Gynec., Brit. Empire, Nov., 1907. Bovée: Am. Jour. Obst., 1903, xlvii, 674. Buckner: Tr. Ohio State Med. Soc., 1851; Ann. Surg., 1905, xli, 824. Cullen: Bull. Johns Hopkins Hosp., 1896, May and June. Eden and Lockyear: System of Gynecology. Goodell: Tr. New York Acad. Med., Nov., 1909. Headley: Tr. New York Acad. Med., Nov., 1909. Johnson: Choyce System of Surgery, i, 424. Kelly, Howard: Johns Hopkins. Rept., 1906, iii, 321. Leonard, V. N.: Bull. Johns Hopkins Hosp., Dec., 1917. Murphy, J. B.: Surg. Clinics, 1916, p. 907. Poluillon: Gaz. med. de Par., 1891, viii, 337. Stevens: Proc. Roy. Soc. Med., London, 1915, viii; Obst. and Gynec., Sec. 67. Sturmdorf: Am. Jour. Obst., 1910, lxi, 311.

PRACTICAL APPLICATION OF LOCAL ANESTHESIA TO SURGERY OF THE LOWER ABDOMEN

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NOTWITHSTANDING what the facts are, or what the future may show them to be, concerning the possibility of applying local anesthesia to major abdominal surgery, it is perfectly evident that the vast majority of clinicians do not accept the premise that local anesthesia can be used with facility in routine abdominal work. While in some large clinics a proportion of 50 per cent, and perhaps in one or two instances even greater than this, has been reached, the abdominal surgery performed under local anesthesia exclusively, in our large clinics is probably under 10 per cent, and even then a vast majority of the cases are confined to the various operations for hernia and to extreme surgical risks in which the use of general anesthesia is considered too hazardous. In view of the fact that the dangers of general anesthesia, both immediate and remote, far outweigh those of local anesthesia, a fact which is, I think, admitted by everyone, there must be some reason, real or imaginary, for subjecting 90 per cent or more of the cases to the extra hazard imposed by general anesthesia. Is it necessary or advisable to administer general anesthesia to such a large percentage of our abdominal cases? Is it possible and expedient to replace general anesthesia by local anesthesia in a large percentage of the cases in which general anesthesia is now used? Obviously, if the margin of safety of local over general anesthesia is admitted, the main reason for denying patients this advantage must be based upon the assumption that the surgical indications cannot be met under local as perfectly as they can be under general anesthesia. It is the object of this communication to attempt to show that this assumption cannot be accepted in its entirety, and to present what might be termed the newer concept of the art of local anesthesia as applied to this field of surgery.

While a complete analysis of the reasons for the failure on the part of the surgical profession to accept local anesthesia in major surgery would take us too far afield, certain facts ought to be presented by those who have given special attention to this subject in order to dispel some of the phantoms and replace them by realities. Clearly, those who admit unfamiliarity with the subject are prone to accept its imaginary objections. On the other hand, to those who are most familiar with this subject the facts are so obvious that their presentation seems more or less absurd, and, yet, these facts must be presented

by those who have acquired the greatest amount of experience in order that the general profession may receive the benefit of their work in this field..

To one who has had considerable experience and success in the use of local anesthesia the objections ordinarily advanced against it are largely evidences of inability on the part of the objector to perfect himself in its use. In this regard local anesthesia has been compelled to contend with much the same factors that obstruct every advance in science. Only a more exact and widespread knowledge will reduce and gradually eliminate this factor, and we would better, therefore, confine our attention to the real shortcomings of the method and consider some of the means by which they may be overcome.

THE PSYCHIC FACTOR

Undoubtedly the psyche of a patient plays an important rôle in relation to surgical treatment. However, the importance of this factor in relation to local anesthesia has been greatly overestimated. In its final analysis the amount of psychic trauma connected with local anesthesia will depend largely upon the education of the patient in relation to its use. Once the patient grasps the fact that local anesthesia is safer and more agreeable than general anesthesia and that his operation will be *painlessly* performed under its influence, the psychic factor will largely fade into insignificance, as I have had ample opportunity to verify. Too often the surgeon mistakes the patient's fear of suffering—a fear which has been established through ignorance or through a knowledge of the unsuccessful use of local anesthesia—for psychic incompatibility. The individual whose acquaintances in large numbers have undergone painless, successful operations under local anesthesia does not to any great extent show this much heralded bugaboo.

WOUND HEALING

The question of wound healing may be dismissed as an objection, as it has been proved beyond doubt that the use of procain does not in any way impede the process of healing or predispose to infection. The reported preponderance of infections where local anesthesia has been used is undoubtedly the result of an interference with a refined technic due to the failure to establish complete anesthesia. Possibly, also, the class of debilitated patients reserved in some clinics for the use of local anesthesia may be a factor in the production of these statistics.

TIME

The element of time, while relatively unimportant, may be cited as a real objection to the use of local anesthesia. However, if we accept the dictum that the patient is the all important consideration, the element of time becomes relatively insignificant. Other things being

equal, can we use the element of time as a shortcoming of local anesthesia? Allowing the patient to be the judge, and saying to him: "Local anesthesia is more pleasant, is safer, and your operation can be performed under its influence with more finesse, but I cannot spare the extra quarter or half hour required"—what would the verdict be? Besides, the facts show that with proper equipment and with modern technic many operations may be performed under local anesthesia with more dispatch than where general anesthesia is used.

HARDSHIP TO THE SURGEON

There is no question but that the routine performance of surgical operations under local anesthesia imposes a greater tax upon the mental and physical resources of a surgeon than where general anesthesia is employed. This is especially true in cases where the surgeon is not well versed in the use of the local method. Here, the possibility of failure, the faulty armamentarium, the division of attention between the operation proper and that required by the conscious patient, the necessity of using a refined technic, the strategy required in meeting complications and overcoming difficult technical details without discomfort to the patient, in addition to the extra time required, all tend to fatigue the surgeon. And, yet, as one's familiarity with the method increases, the pendulum swings until the difference between the two methods is not as great as one might imagine. With increasing experience the possibility of failure is replaced by a feeling of confidence; the armamentarium becomes stardardized; the division of attention becomes more or less automatic, as in the case of the clinical teacher in surgery who has learned to teach while operating; the use of a refined technic becomes second nature and instead of being fatiguing may be said to be exhilarating; increased experience enables one to meet the demands with a comparatively slight outlay of energy; and a strategy is developed by which the technical difficulties are overcome with comparative ease; and, finally, as the technic becomes standardized, the time required, as I have already stated, is but slightly greater where local anesthesia is used.

DIFFICULTY IN ACQUIRING TECHNIC

Admittedly, there is considerable difficulty in acquiring the technic of local anesthesia as applied to major abdominal surgery. Of those who are successfully performing this work the number is small. Like all specialists the experts in the use of local anesthesia seem to follow the plan of making the technic appear as difficult as possible. Complicated rules for locating the special nerves, for instance, tend to magnify the apparent difficulties. As an example, the most recent book upon local anesthesia recommends that the six lower thoracic, three lumbar, and three sacral nerves be blocked on either side of the spine

in the back for the performance of a pelvic laparotomy! Small wonder that such a method does not appeal to those who are in the habit of doing their work under general anesthesia. As a matter of fact, the technic of abdominal surgery under local anesthesia is comparatively simple, and a knowledge of it is exceedingly easy to acquire and can be readily mastered by any one who will focus his attention upon it for a short time, provided he is not so hidebound by age or prejudice that adaptation to an altered order of things is impossible.

METHOD OF OVERCOMING OBJECTIONS

Every effort should be made by those who have had unusual experience in the use of local anesthesia to develop the technic along the lines of simplicity in so far as it is possible to do so. While the highly specialized regional blocking may be desirable for a few trained experts, the average surgeon will find much more satisfaction in using direct infiltration. Its simplicity, its ease of application, its speed and its accuracy make one wonder why so much effort has been made to substitute nerve blocking for the method introduced by Schleich and Reclus. Provided local anesthesia is to become of practical use in abdominal surgery and to be taken from the hands of the few—experts, so-called—direct infiltration, or infiltration-block must be adopted as the method of choice. This method, when properly employed, fulfills all requirements, when combined with the proper surgical technic.

GENERAL CONSIDERATIONS IN RELATION TO TECHNIC

The prime essentials relating to the general preparation of the patient are: proper attention to the patient's psyche, a soporific which insures a good night's sleep upon the night preceding the operation, small doses of preliminary hypnotics to allay nervousness from the time of awakening in the morning to the time of operation, careful transportation to the operating room, a comfortable position upon feather pillows on the operating table, the exclusion of light from the eyes by a moist pad of gauze, the constant attention of a well trained "moral anesthetist," whose duty it is to bestow every possible comfort and to allay, so far as possible, any fears which may beset the patient, the elimination of all unnecessary noises caused by instruments or other utensils, the exclusion of all conversation in the operating room, (possibly, in some cases, introducing pleasant music from a Victrola), the avoidance of all irritations, such as uncomfortable positions, tight strapping and the application of irritating lotions to the skin—these and numerous other details do much to reduce the handicap under which surgeons find themselves when attempting the use of local anesthesia.

LOCAL TECHNIC

Assuming that the above details have been carried out with some degree of completeness, every effort should be made to continue the procedure without allowing a break in the chain of protection against irritating influences. Team work and a smooth running machine are valuable assets, and a standardized, workable armamentarium is a prime essential.

Perhaps the most important period to be bridged while carrying a patient through the ordeal of a surgical operation under local anesthesia is that during which the anesthesia is actually being introduced. The success or failure of the procedure is dependent to such a large extent upon the comportment of the surgeon during these few minutes that we may on the one hand see inaugurated a smooth, efficient anesthesia with a successful operation upon a confident patient, or, on the other, a disgruntled, irritated, apprehensive patient whose confidence has been lost at the very beginning on account of some error in technic.

When introducing the solution, the development of the initial wheal is accompanied by certain preliminaries which are designed to relieve the tension under which the patient may be laboring. These preliminaries vary, depending upon the circumstances, but usually consist of a slight sponging, pinching, or patting of the skin over the field of operation. As the first needle prick is about to be made the anesthetist cautions the patient, stating that the doctor is about to give him a hypodermic. At the same time the surgeon requests the patient not to move when he feels the needle prick. When these precautionary measures are omitted, the unprepared patient is surprised, his confidence—which already may be more or less negative in quantity—is apt to be shaken, and a slight movement on his part is apt to result in dislodging the needle point, thus making it necessary to repeat the procedure.

From this period one important point is to be kept constantly in mind—the patient is to feel no more needle pricks throughout the procedure of making the infiltration. It matters not at how many points the skin is to be pierced by the needle, the unanesthetized skin must not be pierced. It may be avoided by the following technic. The long needle is introduced through the initial wheal and advanced beneath and parallel to the skin surface in the subdermal fat to a point within a half to three-fourths of an inch of its base. Just in advance of the point the skin surface is made to curve inward by making pressure upon it with the finger of the opposite hand. The needle is thus made to enter the skin from beneath and a wheal is in this manner painlessly produced. During the withdrawal of the needle a subdermal infiltration is made between wheals number one and two, or, if desired, this infiltration may also be made during the introduction

of the needle from the initial to the secondary wheal. This procedure may be repeated as often as necessary, and thus a field of any length may be traversed.

To my mind, this is the most important single factor in the technic of the administration of local anesthesia, and careful attention to the carrying out of its minutest detail will do much to facilitate the work. On the other hand, when following the usual technic, or that usually seen at least, where the patient is repeatedly pricked in an unanesthetized area, we must expect even the most stoical to ask for an interpretation of the term "painless." Even where the intradermal wheals are continued from the initial wheal and the skin infiltrated for any distance, too rapid injection will cause pain. Besides, this process is slow, laborious and unnecessary. The subdermal infiltration will be found to give complete anesthesia in from two to four minutes, and as the deeper layers should be anesthetized before the incision is begun this amount of time is sure to elapse before the incision can be made.

After the outline has been made upon the skin by the more or less regularly placed wheals and the line of subdermal infiltration, the deeper layers are anesthetized before making the skin incision. There are many reasons why the method of injecting the tissues layer by layer should be discarded, at least as a routine procedure. The delay occasioned by its use is in itself sufficient to condemn it, especially as the complete infiltration is so satisfactory. I feel, however, that the main objection to it is based upon the greater likelihood of the production of pain when this plan is followed. The immediate infiltration of the deeper layers gives the anesthetic time in which to act on these tissues while the preliminary incision is being made, towels applied to the skin, etc. Except in very fat persons one may quite accurately recognize the different layers as they are reached by the needle point and the requisite amount of solution may then be deposited. An approximate estimate of the thickness of the different layers, as well as a knowledge of the relative sensitiveness of the various tissues to be injected, is essential. Any errors as to the thickness of the different layers are to be checked by the impression made upon the patient as sensitive areas are encountered. In the abdominal wall, for instance, after the subdermal infiltration is made the next layer to be encountered which interests us is the aponeurosis. This layer can be recognized by its "feel" and by the fact that the patient will manifest signs of discomfort when it is reached, although if care is used this discomfort is slight. The anesthetist can usually catch the change of expression on the part of the patient, but a desirable guide is the slight muscular contraction which invariably accompanies any appreciable insult to sensitive tissues. Once the approximate depth of this layer is estimated, the fluid is deposited in sufficient quantity to produce anesthesia ahead of and about the needle point for some distance,

thus making further punctures possible without the patient or the local part realizing that it is being done. A perfect knowledge of the anatomy of the part allows one to make the injection without any complaint on the part of the patient, and with only slight muscular protest. Of course, one must regulate the speed and amount of the anesthetic used in a given area by the sensitiveness of the tissues, a condition dependent upon the location of the area attacked, as well as upon the make-up of the individual patient. For instance, one patient may allow the complete blocking for an appendectomy in two minutes without the slightest local or general protest, while in another patient of about the same dimensions five minutes may be required for the same procedure. The deep layers of muscles in the abdominal wall, while containing some sensory nerves, are relatively devoid of sensation and need very little of the anesthetic. But, as there is little objection to the use of the solution here, it is better to play safe and to continue the injection as the needle advances toward the properitoneal fat, which is the most sensitive tissue beneath the skin. This tissue is, therefore, approached and entered with a constant stream flowing from the needle. As soon as the slightest sign is manifested by the patient, or even if no signs, local or general, are shown, the area about the point of the needle is "soaked," the needle withdrawn and new fields attacked by repeating the procedure. The same precautions should be used by the surgeon when he is about to enter an area which may be sensitive, as when the first wheal is made. I usually say: "Let me know if you feel this;" or, "Is this sensitive?" etc.

There seems to be much timidity on the part of surgeons regarding the making of deep infiltrations into the abdominal wall. The dangers from this procedure are more apparent than real, and experience shows that they are practically nil. We have repeatedly advanced the needle through the abdominal wall with the abdomen open and fluid flowing from the needle in order to learn what takes place when this maneuver is carried out. Colored solutions have sometimes been used for this purpose. We have found that, provided the needle is slowly advanced, the properitoneal tissue becomes swollen from the outflowing fluid and the peritoneum generally floats away from the needle point and is not subject to puncture, provided, as I have said, the needle is not advanced rapidly. The peritoneum may be punctured, reproducing the condition we have in the intraperitoneal injections of guinea pigs and other animals, where, as it is well known, intestinal injury does not occur. This fact is now established beyond question and should have marked influence in simplifying the technic.

While carefully carrying out the above principles in the minutest detail the field for infiltration is gone over methodically and systematically with the object of not missing a fraction of a square inch. It is here that the use of the pneumatic injector assumes a special rôle

of superiority over the syringe. The constant source of supply of the solution relieves the operator of the necessity of filling or changing syringes, a maneuver which is prone to make the surgeon "lose his place" and to miss a small area which may correspond to the location of a sensory nerve. Again, the lightness and adaptability of the cut-off allows one to develop an ability to "feel" the location of the needle point and to introduce and direct the needle with the greatest ease.

Once the tissues are thoroughly "soaked" anesthesia should be complete almost immediately, or at least before the various layers are reached by the scalpel. The skin may be incised directly after the deep injection is completed, and a secondary cleansing with alcohol or some other solution is made.

In making the incision in abdominal cases it is well to avoid making pressure upon the abdominal wall. Even with a perfect anesthetization the pressure produced by the use of a dull scalpel, especially in unskilled hands, will cause the patient discomfort even in "interval" cases, while in cases of acute or subacute infection pressure will not be tolerated. In order to meet this contingency we elevate the skin between two pairs of towel clips while the incision is being made. (Fig. 1.) A sharp scalpel is used and multiple gliding strokes are made rather than forceful pressure of the blade through the tissues. The delay necessitated by the placing of towels for skin exclusion allows the deep tissues sufficient time in which to become anesthetized, and the incision is carefully carried down through the succeeding layers, care being taken not to slacken for an instant the vigilance regarding the elevation of the abdominal wall until the peritoneum is finally opened.

At this point I beg leave to digress for a moment in order to call attention to the usual causes of failures in some cases to obtain a satisfactory working condition when the abdomen has been opened under local anesthesia. Surgeons have frequently said to me when discussing this subject, "I can open the abdomen without any complaint whatever on the part of my patients, but as soon as the abdomen is opened intestines present in the incision under pressure and the force and manipulation necessary in order to retain them within the abdomen not only causes my patients great distress but serves only to increase the expulsive efforts, and, as a result, the field of operation is so obscured that the operation cannot be carried on." Provided this condition presents frequently it is small wonder that surgeons find that the use of local anesthesia is unsatisfactory in major surgery, and especially in abdominal surgery.

The patient who does not have a complete anesthetization of his abdominal wall before it is opened, one who has not a complete abolition of the reflexes of the tissues attacked, will, by the time the

peritoneum is opened, have developed a combative action on the part of the abdominal muscles (an action, by the way, over which he has no control), which will, by causing a contraction of these muscles, tend to place the abdominal contents under a pressure which will force the viscera into and through the incision as soon as it is made. Counterpressure applied to the escaping viscera instead of relieving the situation serves only to add fuel to the flame, the condition going from bad to worse and the fiasco usually ending in a call for general anesthesia and a firm decision on the part of the surgeon not to attempt this procedure again.

This condition may present even in cases where the patient does not complain of pain, and, possibly, in some patients no amount of local

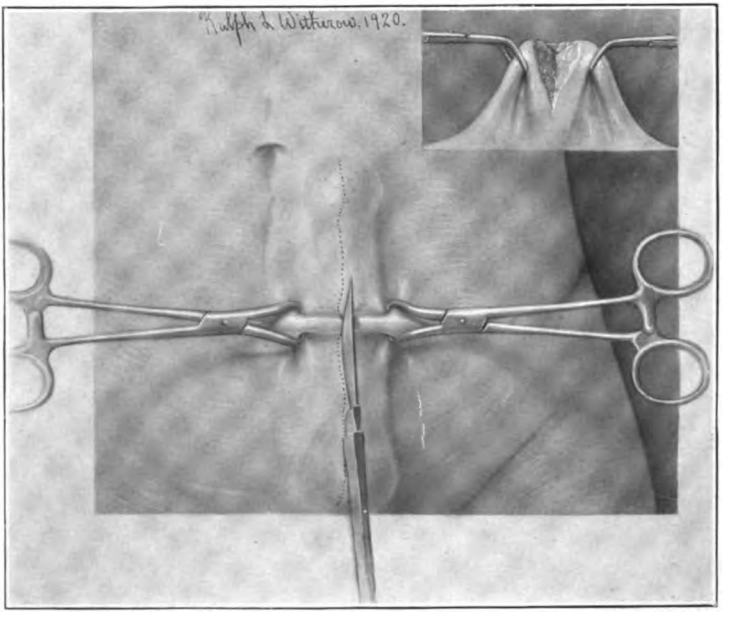

Fig. 1.—Method of elevating skin while making the incision.

anesthesia will prevent it. However, I have not encountered it in cases which were at all amenable to operation under local anesthesia. We do find an occasional person who loses all poise and cannot control himself when the test comes, and such a case should be given general anesthesia without delay. For the purpose of this discussion, however, we may consider only cases which are apparently satisfactory candidates for the local method. It is in this class of cases that the failures have come, for, as a rule, men do not attempt to force the method upon the other class. Given an average candidate, therefore, can this emergency be anticipated and prevented? As a rule the condition described is due to the fact that the patient has been caused pain during the infiltration and incision, notwithstanding the

fact that he may not have complained. Surgeons differ very materially in their estimate of this factor. Some call a procedure "painless" when a patient is continually flinching, making grimaces in direct consonance with each painful maneuver on the part of the surgeon or even when mild restraint is necessary. Others call a procedure "painless" when they have been repeatedly called upon to reenforce the anesthesia. While some even consider a procedure "painless" when the patient is fervently grasping some friendly bystander by both hands and hanging on for dear life.

Much has been written upon the pain sense of the different intraperitoneal structures. Few authorities agree upon this important subject, each giving the results of his studies and observations. Careful study has been made of the works of Hertzler, Lennander, Haller, Bichat, Weber, Bloch, Richet, Kast and Meltzer, Ritter, Wilms, Propping, Ramström, Langley, Bayliss and Starling, Cannon, Auer, Kuntz and Mackenzie, and, in addition, a large series of my own cases have been carefully observed in order to clear up, if possible, some of the disputed points. Going over the literature one is struck with the marked contrast in the reports of different observers, and, aside from theoretic or anatomic grounds upon which arguments are based, I believe that much of the difference of opinion is due to the fact that the findings are far from constant and vary somewhat in different individuals even under similar conditions and vary greatly under a variety of conditions. The various stages of peritonitis greatly influence the sensitiveness of the parietal peritoneum and the viscera. The general condition of the patient must be taken into account, and one must not forget that the patient who has been a sufferer with a painful retroversion and chronic appendicitis will respond much differently than will an individual who is the subject of some other pathological condition. It is generally taught that the parietal peritoneum only is sensitive and that the viscera are devoid of pain sense in the absence of traction upon the mesentery. It has been my observation that this is not entirely true. Traction upon the intestine, even without traction upon the mesentery, will cause pain, and heat applied to the exposed intestine will produce cramps which are described as gas pains. I have had a young man of excellent poise and intelligence state that the introduction of the needle through the wall of his intestine was painful, and a careful test showed that he could feel the needle pass through his intestinal wall, even though his eyes were covered and an effort was made to deceive him. Traction upon the mesentery was here carefully excluded. The parietal peritoneum, in the absence of inflammation, is insensitive to light touch or even to scratching. However, pinching or traction is disagreeable. In disease this structure is sensitive even to light pressure. This is especially true of certain areas, as for instance the culdesac. The results

of observation will also vary with the manner in which the experiment is made. A brisk, quick action will cause complaint, when the same act stealthily performed may be tolerated readily. One observer states that the mesoappendix may be clamped without pain, and this observation is based upon a series of fifty cases; while another finds that this structure is always found to be sensitive, epecially in acute appendicitis. The facts are that the sharp application of a hemostat to the meso will elicit a complaint from the conscious patient who has not had preliminary medication, unless cocaine has been used. (Some authors state that cocaine acts as a general analgesic, but I have had no experience with it). However, if one slowly and carefully applies the clamps, the patient may not remonstrate.

Many factors must be considered in making observations. Whereas, as a rule the patient who is undergoing an operation under local anesthesia is ready to complain at the slightest opportunity, and may even complain when not being hurt, perhaps with the hope of making the surgeon more cautious, we must not forget that he may have been compelled to suffer so much during the first stages of the operation that, by comparison, the clamping of the mesoappendix may not bring forth a complaint.

I have found frequently that a strong clamp may be placed upon the mesoappendix, provided it is forced down very slowly, with only slight complaint on the part of the patient. This is also true of many other tissues. We have found that the base of the appendix may be clamped with no pain sense after the meso has been blocked or divided. The ovarian pedicle and even the fundus of the uterus are tender and cannot be attacked without causing pain, although the latter may be found to be almost insensitive in some cases. The large vessels in the mesentery are sensitive; and even those in the omentum, if clamped close to their origin, may show pain sense. There is, therefore, an opportunity to perform operations upon most of the pelvic viscera when the above mentioned areas can be blocked before the operative procedure is begun. Pathologic conditions which cannot be handled without traction upon the mesentery, mesoappendix, or posterior abdominal wall may not lend themselves so readily to this form of anesthesia. Here again, however, we have a good illustration of the difference between careful and rough handling of the tissues.

THE PELVIS

All work in this region is best done with the patient in the Trendelenburg position, and it is desirable that the position be assumed several minutes before the anesthetic is injected, and that when in this position the patient be at ease and comfortable. The accessories shown in Fig. 2, are valuable adjuncts in obtaining the desired comfort. Soft pillows, pneumatic cushions for the shoulders, metal legholders

which restrain but do not constrict, the avoidance of too sharp flexion at the knee, which, with an extension of the head upon the neck greatly increases muscular resistance of the abdominal wall, and a careful adjustment of the drapes all tend to facilitate work upon this region. While attention to these details may seem unimportant, success can only follow such attention, and he who is not willing to pay heed to the smallest detail and does not recognize the prime essentials, of which the patient's comfort is one of the most important, will continue to bore us with the information that local anesthesia is unsatisfactory in pelvic surgery.

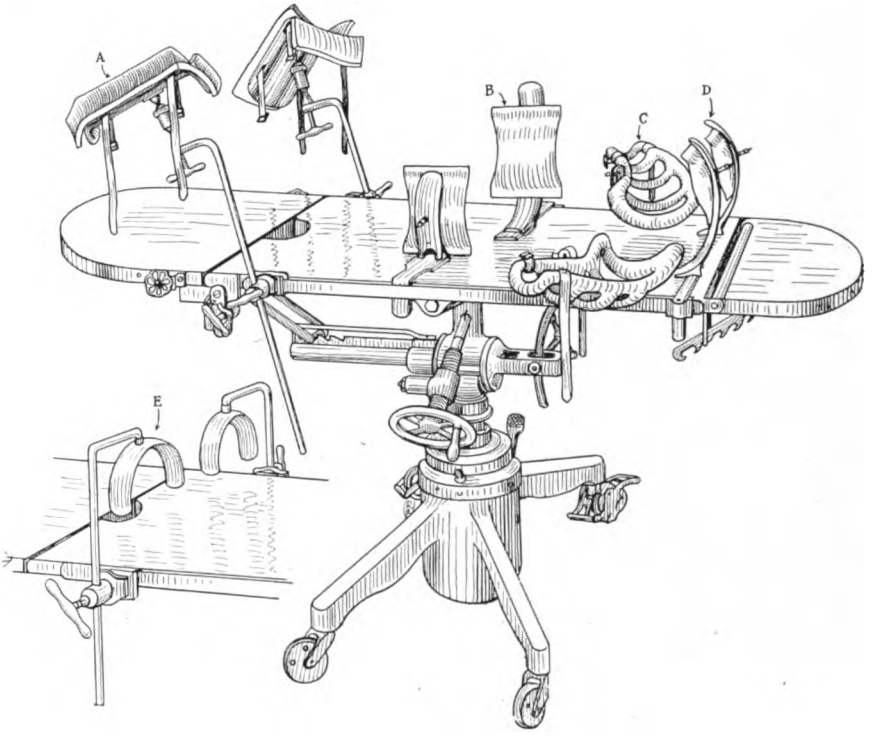

Fig. 2.—Special table with appliances for making the patient comfortable. *A*, Adjustable leg holder; *B*, lateral supports for tilting; *C*, adjustable arm holders; *D*, shoulder supports for Trendelenburg position; *E*, efficient, comfortable thigh restraints. Note: *B* and *D*—inflated segments of auto tire.

The abdomen being opened by an incision which is liberal in its proportions should present a negative pressure. Retraction should be made in a vertical as well as a lateral direction, that is, at right angles to the plane of the abdominal wall, and at first the upper or umbilical end of the incision should be lifted. This increases the capacity of the upper abdominal cavity and generally the force of gravity alone will cause all small intestines to migrate above the pelvic brim. In case this ideal condition does not prevail and some coils of intestine remain in the pelvis, they may generally be "kicked"

out and upward by means of the rubber tipped thumb forceps. Even though in some instances a fairly large amount of the small intestines hangs over the pelvic brim this may not materially interfere with the performance of the more simple pelvic operations such as suspensions, appendectomies, and the like. The retraction must be carefully made, and the force used must be so graduated as to prevent any sudden, jerky lifting of the abdominal wall, which is apt to prove painful to the patient and to cause the much dreaded expulsive effort. As a rule no sponges are introduced either for the purpose of transferring the intestines from the pelvis to the upper abdomen, or for the purpose of holding them in that position. Under ideal conditions this should not be necessary and generally the only reason for using them is to prevent soiling.

The first point to be blocked upon entering the pelvic cavity from above is the round ligament. This is accomplished by having the assistant gently lift the abdominal wall in the region of the wound opposite the round ligament. (Fig. 3.) This allows the operator to see some portion of the ligament, which is carefully picked up with the long tissue forceps and steadied while the needle is inserted into it. A point well toward the front is chosen as the nerve supply comes from the direction of the abdominal wall. A wheal is raised and an effort made to extend the infiltration beneath the peritoneum on both sides of the round ligament. This maneuver is repeated on the opposite side and the technic to follow will depend upon the operative procedure which is to be carried out. Provided the appendix is to be removed this may be done while the procain which has been injected into the round and broad ligaments is given plenty of time in which to disseminate. A delay of a few minutes is rather desirable than otherwise.

With this technic all of the simpler operations within the pelvis may be performed. A maneuver which causes the patient some distress is the elevation of the fundus from the culdesac, which I have mentioned before. While the disturbance is not great, it may be well in nervous individuals to precede the operation by introducing a vaginal pack, with the patient in the knee-chest position. This greatly facilitates the replacing of the uterus.

Ovarian cysts of large size are best evacuated by suction through a comparatively small abdominal incision, the walls being grasped by tenaculi as soon as they become slightly relaxed. In this manner the cyst may be delivered, the pedicle blocked and dealt with without the slightest sensation of pain and without the possibility of soiling, which becomes an exceedingly important matter in malignant disease.

Even where the results of inflammatory disease are present much may be done by strategy in meeting the indications. A perfect exposure with a perfect negative pressure may and often does give

one the opportunity to see the retaining bands which anchor the tissues that are to be excised to the posterior abdominal wall with the aid of only slight traction while the bands are cut with knife or scissors and the parts liberated. We have in a number of instances removed adherent pus tubes by following this plan. Masses which appear very adherent and resistant will be found at times to shell out easily after cutting the "key" bands directly under the eye. The important point is to locate the lines of cleavage with as slight an

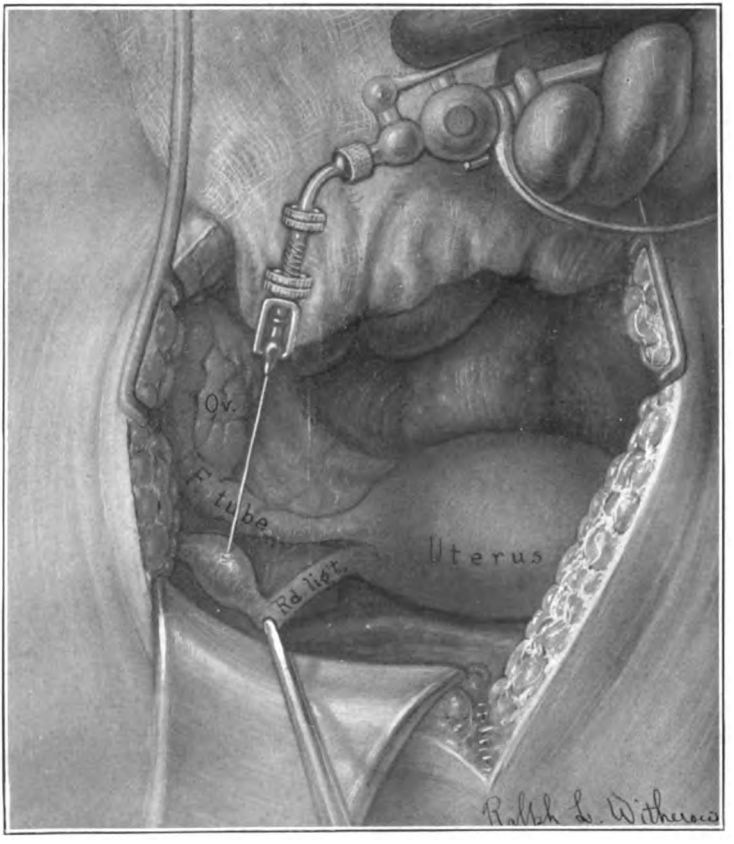

Fig. 3.—Showing method of blocking the round ligaments by injection.

amount of traction as possible and to clip the retaining bands as they appear.

The removal of large uterine or ovarian tumors is accomplished with the greatest ease, provided the pedicles are sufficiently long. Tumors with short pedicles, when delivered, are apt to place the pelvic tissues upon the stretch and therefore produce distress. We have for many years performed all our hysterectomies and myomectomies under straight local anesthesia, except in this class of cases. In all cases where these complications are probable, or where pelvic inflammation

is present, or in the presence of malignant disease, the condition may be met satisfactorily by augmenting infiltration of the abdominal wall, just described, with a caudal anesthesia.

CAUDAL ANESTHESIA

The analgesia resulting from the introduction of procain into the caudal canal is usually sufficient, especially with the patient in the Trendelenburg position, to allow one to make free dissections in the pelvis. We have, indeed, occasionally found an anesthesia up to the third or fourth thoracic nerves. Four ounces of one-half per cent procain has given us the best results. Steel needles of rather large caliber, from which the temper has been removed, are used. They are equipped with blunt obturators which facilitate their passage along the sacral canal and safeguard them from entering the veins. The patient is placed in the prone position, face downward, the skin and subcutaneous tissues anesthetized and a small puncture made with a tenotome. The fluid is introduced slowly, the guide being the patient's complaint of pain along the course of the nerves. In our experience slight toxic symptoms are not uncommon with this form of anesthesia, and in very fat women the sacral hiatus is sometimes difficult to locate. The toxic symptoms consist of pallor, accelerated pulse and nervousness, and have never, in our experience, been alarming. Provided this form of anesthesia is proved safe, it would seem probable that it will become the method of choice for pelvic, rectal and bladder work.

Under ideal conditions the absence of movement of the pelvic viscera, the blanched condition of the pelvic organs permitted by the freedom from abdominal packs and straining on the part of the patient, the possibility of deliberateness and the opportunity to minimize trauma, with the additional advantage that results from a perfect postoperative repose of the viscera in the same relative position they occupy when the peritoneal toilet is completed, at once place the above detailed method upon a plane which challenges the best that competing forms of anesthesia can present—this, in addition to and notwithstanding its admitted advantage over any other form of anesthesia in regard to safety.

OPPORTUNITIES FOR THE STUDY OF ADVANCED OBSTETRICS

By A. M. Mendenhall, M.D., Indianapolis, Ind.

During the past decade much has been said and written relative to the teaching of undergraduate obstetrics and considerable progress has been made, but there has been little or no progress in the teaching of postgraduate obstetrics and the opportunities for the pursuit of advanced obstetrics have not been appreciably bettered.

The only apology for bringing out this paper is that the author has recently gone through the personal experience of trying to find opportunities of this kind and has been approached many times within the last few years by men seeking information as to where they might be able to make a deeper study into the intricacies of obstetrics. He has always been confronted with the one outstanding fact that the opportunities are exceedingly few and correspondingly difficult to obtain.

In approaching this subject I desire to arbitrarily divide the study of obstetrics into four general periods,—undergraduate obstetrics, junior obstetrics, senior obstetrics, and postgraduate obstetrics. This division is made purely for the sake of convenience in discussing the subject and with the full knowledge that there can be no absolute dividing lines but that one period merges imperceptibly into the other and that postgraduate obstetrics may be pursued at any time after the completion of the ordinary undergraduate course.

Some eight years ago Williams, of Baltimore, in writing on the midwife problem[1] rather boldly exposed some serious defects in the obstetrics of this country and two years later gave us a sad revelation of facts regarding our undergraduate instruction in obstetrics.[2]

Until the last few years it has been exceedingly difficult to place the department of obstetrics in our medical schools on the high plane it deserves. This has been partly due to the fact that the medical profession has been slow in its appreciation of obstetrics as a specialty, and partly due to the inability to secure and finance a large maternity to supply clinical material sufficient for a thorough course. However, these obstacles are rapidly being overcome so that at present a number of our medical schools have large maternities with indoor and outdoor departments extensive enough to furnish clinical material for very satisfactory undergraduate study. The doctor graduating from such a school should have at least sufficient knowledge of obstetrics to recognize his own limitations and be cognizant of when he should call in

superior skill. As conditions now exist it remains a fact that a great many deliveries will continue to be made by the general practitioner and while it is just as obvious that we cannot make of him an obstetrician as it is that he cannot be a surgeon, our present hope should be that he be sufficiently trained in obstetrics to promptly recognize abnormalities and just as promptly refer the case to his especially trained colleague. When this day arrives, obstetrics will have taken long strides forward and the accidents, injuries, and deaths resulting from pregnancy, labor, and the puerperium will be greatly reduced.

The next step in the study of this subject might be called "junior obstetrics," or the training that is obtained by the hospital interne on obstetric service. Most of our general hospitals which maintain an obstetrical department furnish some opportunity to their internes to advance their knowledge in obstetrics but often this is quite insufficient in time and clinical material for a great amount of training. In contrast to this we now fortunately have a large number of high class maternities where one can secure an appointment as interne for three, four or six months and really get a most valuable training in obstetrics. Usually these services are divided into indoor and outdoor periods of about equal duration so that excellent training is secured in the handling of normal cases and opportunities offered to diagnose and recognize the abnormal ones. And the progressive student will here do a large amount of reading and reference work and thereby add materially to his knowledge of the theory of obstetrics.

It is exceedingly unfortunate that the average individual is so constituted that he rushes through his study of a normal case and longs to be permitted to handle the abnormal, all the time failing to realize that only in the examination and handling of large numbers of normal cases can he become skillful.

The ability to make a thorough and accurate antepartum examination can only be developed by a large amount of practical experience, but the man who conscientiously applies himself to one of these junior courses in obstetrics and then goes out to do the obstetric work accompanying general practice will greatly surpass in skill and success his fellow practitioner who has been denied such a course. And such a man has approached the stage in the study of obstetrics where he finds it difficult to go further. One thing he can usually do is to duplicate his course in junior obstetrics and usually to a very distinct advantage if he desires to continue obstetrics as a specialty.

He is still in the stage where he needs to continue in large numbers of antepartum examinations, and in attendance upon normal cases until he has grown materially in his ability to recognize the case which is not normal. He will, no doubt, have seen many cases go on to spontaneous normal delivery which he at first thought were very unlikely to do so and with this experience it is to be hoped his *furor operandi* will have been checked and dampened. During this pe-

riod he should be a good listener and observer and watch the progress and conduct of the abnormal cases and do an abundance of reading.

Then comes the question which has stimulated the writing of this paper: Where may he pursue the subject further? He has reached the stage where he needs the opportunity to see and examine and diagnose, as well as to at least assist in the handling of a large number of abnormal cases, and this can be obtained in no place other than a large maternity. He should have under his close and continued supervision many abnormal cases and be able to follow them through their lying-in period and should also have a wide experience in early and late postpartum examination in order to familiarize himself with the results of childbirth upon the woman.

The very nature of obstetrical abnormalities is such as to almost preclude the possibility of a man becoming an efficient obstetrician merely by assisting even the highest class man in his private practice. The usual private practice, though it be quite extensive, does not include a sufficient number of abnormal cases to offer the best training.

Hence it becomes necessary to secure a connection with one of our large maternities and in a position which might be called senior resident or house surgeon, but the difficulty is that there are so few of these positions and so many applicants for them that many excellent men are turned away.

The author, in making a survey of the subject up to date, has written to most of the leading maternities in the country or visited them in order to determine definitely just what opportunities are available, and desires to mention a few of them and to show what is being done to better the situation.

New York City seems to head the list, as there we have the New York Lying-In, The Long Island College Hospital, The Manhattan Maternity, and the Sloane Hospital for Women. At the New York Lying-In there are two indoor house surgeons and this service is excellent. The appointment is usually given only to men of considerable previous surgical and obstetrical training and but rarely to one who has not had considerable previous service in the indoor and outdoor departments of that hospital.

The Long Island College Hospital has one resident in obstetrics and this is a most desirable position. Likewise the Sloane offers very good training to one or two men a year in advanced obstetrics. The Manhattan Maternity with its large facilities as yet offers very little more than an interneship. Dr. DeLee informs me that the Chicago Lying-In has positions as resident physician open to two men each year and no doubt this will be a valuable service at least when the hospital becomes a charity institution as the indications are that it will soon. In this connection should be mentioned the service of the Johns Hopkins Hospital where there is an abundance of material also. The Committee on Medical Research of New York City has just formulated

plans for teaching advanced obstetrics. They will soon be able to handle four men each year, and as the appointments will be made only to men who have had considerable previous training in obstetrics, this is going to be a very distinct addition to our facilities. On the maternity service at the University of Pennsylvania there has just been added a year's residency, and with the vast amount of clinical material and teaching facilities there, this offers a valuable service.

Likewise in connection with the postgraduate school of the University of Pennsylvania, starting this year there will be given a rather comprehensive course in gynecology and obstetrics. Provided this offers a large amount of practical work, it should be a marked step forward, as it is something distinctly more than the usual so-called postgraduate course.

And this leads me to my fourth division in the study of obstetrics—namely, postgraduate obstetrics. Up to date there has been but little offered of real value in postgraduate instruction in obstetrics. There are a large number of places where such courses are offered and the only requirement for admission is usually the fee. They consist, for the most part, in a rather unsystematized course of lectures and clinics with little or no practical work, and are of value chiefly as a review. The man who knows a little obstetrics may at times pick up a few valuable points and the general practitioner may be able to learn of a few of the advances being made in the subject and sometimes takes the information back with a little profit to his patients. But beyond the possibility of a short review of obstetrics he has obtained little more than a rest from his practice.

The postgraduate courses in some branches of medicine are of a little more value than this, but in giving proper credit to this method of teaching advanced obstetrics, the author desires to quote from the recent address of the retiring president of the Clinical Congress of Surgeons of North America and in doing so to assert that what is said in this address on postgraduate work in general applies especially to obstetrics.

In this article Dr. John Clark, of Philadelphia,[3] in speaking of the conditions created at the close of the war whereby many physicians are looking for new fields, says that "to such men we should be prepared to offer ample facilities for postgraduate study, not of the old commercial type, such as our schools have been guilty of purveying in the past, but a full and comprehensive training of sufficient length to lead to a master's degree. The wretched postgraduate instruction of past years should be cast into the discard and courses should be arranged of such essential value that upon their completion by a student, his diploma, or certificate, will be a real and trustworthy evidence of his ability to practice in that special branch. The six weeks' or even the six months' course of previous years was little less than a "bunco" game, in which the postgraduate student was given a smattering imi-

tation of knowledge, and he in turn went into practice delivering the same deceptive article to his patients. It has been said that the patient who pays five or ten dollars as an obstetric charge is usually cheated, so likewise is the postgraduate cheated who takes a six weeks' postgraduate course, be his tuition fee small or large."

It is most deplorable to find that so many men who have "had a large obstetrical practice" in connection with a general practice go to some one of these commercial institutions, enroll, pay their tuition fees, sit on the benches a few weeks and go back home to do "obstetrics as a specialty". And this condition cannot be improved upon greatly until a few more opportunities for studying advanced obstetrics have been created similar to the few mentioned here. When the situation is gone over conscientiously, it is evident that only some eight or ten vacancies occur each year where really worth while work can be done and one must be fortunate enough to be one of the eight or ten selected or he is without a place to pursue his chosen work.

In closing it should be said that a ray of light is shed by the efforts being made in New York City by the Committee on Medical Research, also, though in a more embryonal stage, by the University of Pennsylvania. If these or other similar movements backed by the leaders in the profession of the city as these are backed can secure sufficient financial support to conduct large indoor and outdoor maternity departments then in addition will give the proper amount of time in actual teaching, they will grow rapidly and may soon offer many increased opportunities to the man desiring to go into obstetrics as a specialty.

The proposed movement in New York City is very comprehensive and carries with it the idea of sending their students around from clinic to clinic and thereby offers a distinct innovation which seems to be very promising. But there still remains a number of rather large maternities where it seems that a position of senior resident could be created with distinct advantage to the profession and to the credit of the institution and to the improvement of the care of the patients.

The country is now all too well supplied with places to see and listen, but the man in taking up advanced obstetrics, just as the man going into surgery, must have an opportunity to do some of the work himself. And until there is a very distinct increase in the number of opportunities to study higher obstetrics, we will still be met with large numbers of very poorly trained men who call themselves obstetricians.

REFERENCES

[1]Jour. Am. Med. Assn., Jan. 6, 1912, p. 1.
[2]Ibid., June 6, 1914, p. 1767.
[3]Surg. Gynec. & Obst., Jan., 1920, p. 101.

A STUDY OF THE HEMOGLOBIN AFTER CHILDBIRTH WITH SPECIAL REFERENCE TO THE RESUMPTION OF MENSTRUATION

By M. Pierce Rucker, M.D., Richmond, Va.

WERE I inclined to levity on this occasion, I should define pregnancy as a disease of profound metabolic disturbance that terminates by crisis about the two hundred and eightieth day. The analogy could be pursued further in the same spirit of playfulness, in the consideration of its etiology and symptomatology. The chief factor in its causation has been well known for ages, as numerous passages in the Old Testament show. Modern medicine has been able to throw very little additional light upon the subject. Take, for instance, the question of natural immunity. Why some women never conceive is clouded in as much mystery now as it was in Biblical times. Then there is an acquired immunity, which is a sore subject to obstetricians. Yet truth compels me to state that even today, with abundant and sufficient knowledge of asepsis available, one attack of pregnancy too often confers a lasting protection.

But, whether we consider pregnancy a pathologic condition or a physiologic one, a study of the blood indicates that a profound change takes place. A decade ago, medical literature was full of reports of cases of pernicious anemia due to pregnancy. These cases occurred either before or after delivery, and the outcome was thought to be usually fatal, although Osler,[1] in a recent article, considered them to have a rather favorable prognosis. Thompson[2] studied the blood in twelve cases of "normal" pregnancy. He found that in the middle months of pregnancy there was a decrease in hemoglobin and an increase in leucocytes. As the patient approached term, there was an increase both in the percentage of hemoglobin and in the number of white cells. Bear[3] has shown that at the crisis, especially in primipara and in patients having hard labors, there is a leucocytosis, the count often reaching 18,000. So far as I have been able to find out, there has been no report of a study of the hemoglobin following delivery.

It is a popular belief that a woman does not menstruate so long as she nurses her baby. Why this should be, I cannot understand, for all the medical literature on the subject is opposed to this belief. Sundin,[4] in a study of 400 cases, found that from 55 per cent to 59 per cent menstruate while still nursing their babies, and that more than one-third begin menstruating in the first two months after childbirth. Jacobius[5]

found that 79 out of 180 lactating women were menstruating the sixth month after delivery. He was unable to make out that menstruation had any effect on the baby save possibly a very transient restlessness or diarrhea. He found no changes in the milk at this time. Sanes,[6] however, states that menstruation during lactation was not of the patient's usual type, it is frequently of longer intervals. The periods of amenorrhea preceding the establishment of menstruation were found to be variable. The patient's behavior in this respect varied with different pregnancies. Ehrenfest,[7] in a study of 209 patients and 309 births, finds that in over 80 per cent of all lactations first menstruation appears before the cessation of lactation. In primiparous women the percentage is still higher (84.6 per cent). He finds that retrodeviation of the uterus favors an early resumption of menstruation, 70.3 per cent as compared with 51.3 per cent of unclassified cases beginning to menstruate within twelve weeks postpartum. He concludes as follows: "A debilitating influence exerted immediately by labor and later by the loss of body fluids during lactation, with rare exceptions, temporarily arrests ovulation. As soon as the disturbed equilibrium is restored, the ovary resumes its function of ovulation, and the first corpus luteum sends its specific hormone to the endometrium. The response of the latter probably to a certain extent is dependent upon the anatomic condition of the uterus. If normal, a typical menstrual flow ensues; if subinvoluted or for other reasons hyperemic (retroflexed) the reaction may be unusually strong. On the other hand, if the uterus is in an atrophic condition, it may require the stimulations from more than one ovulation until it becomes anatomically restored to the degree of resuming its function. As a rule, menstruation continues practically regularly during lactation when once established. The debilitating effect of lactation is obviously dependent upon the general condition of the woman. Therefore, usually the disturbance in the equilibrium of body fluids ends sooner and menstruation reappears earlier in the strong and healthy woman. For the same reason the amenorrheic state in general will last longer in the sick or weak woman, in the primigravida, whose labor, as a rule, is longer and more exhausting, and in the woman suckling a large child. But in the majority of women the equilibrium is regained before they have actually ceased to nurse their children, and, therefore, in the majority of instances menstruation reappears before the function of lactation is ended." It is not quite plain, either in Ehrenfest's analysis of his cases or in the fitting of his facts to Fraenkel's theory, why retrodisplacement of the uterus favors early restoration of ovulation.

Novak,[8] by correlating the histologic appearance of the corpus luteum removed at operation with the clinical history of the patient, finds that the corpus luteum matures at the time in the menstrual cycle in which the endometrium exhibits the premenstrual hypertrophy. He believes

that the luteum cells are concerned in the causation of the menstrual phenomena, and thinks that the paraluteum cells are concerned in the important function of fixation of the ovum in the early part of pregnancy. If I read Novak right, ovulation precedes menstruation by the length of time it takes the corpus luteum to develop, i. e., 28 days, and there is no need for an elaborate conjecture as to the condition of the uterus to explain why pregnancy may, as it often does, take place before menstruation reappears, as is done by Ehrenfest; or the assumption of a menstrual-inhibiting hormone formed by the lactating breast, as is done by Novak. The latter states that the amenorrhea of anemia, phthisis, and other

TABLE I

SERIES OF 74 CASES WITH HEMOGLOBIN ESTIMATION

CASE NO.	HB. ON ADMIS.	MONTHS I	II	III	IV	V	VI	REMARKS
36	.	.	.	75	.	.	.	.
40	.	.	.	84	.	.	.	Influenza
91	.	.	.	.	.	.	.	Hemoglobin 72% in the X month.
174	.	.	.	.	.	.	.	Hemoglobin 61% in the VII month.
234	.	.	.	.	.	.	80	.
238	65	.	.	.	.	.	.	Hb. 70% in the IX and 85% in the XI Mo.
240	.	.	.	.	.	70	.	.
254	75	.	.	.	.	.	.	Hb. 70% in the IX month.
261	60	.	.	.	.	.	77	.
270	.	.	.	.	62	.	67	.
279	.	.	.	63	.	.	.	.
281	.	.	.	70	.	.	.	.
285	85	.	.	.	80	.	.	.
289	.	.	.	62	.	.	.	.
292	.	.	.	60	.	.	.	.
293	70	.	.	.	.	74	.	.
304	.	.	68	.	.	.	.	.
308	55	.	55	70	.	.	.	Broken kidney compensation.
310	.	.	74	.	.	.	.	.
311	.	.	71	.	.	.	.	.
312	.	.	70	.	.	.	.	.
315	45	.	.	77	.	.	.	.
322	80	.	.	80	.	.	.	.
325	45	.	.	81	.	.	.	.
326	95	.	70	.	.	76	.	.
333	.	.	70	.	.	.	.	.
336	85	.	.	.	.	.	.	.
337	73	.	.	.	74	.	76	.
341	61	.	85	.	.	.	.	.
342	.	.	.	63	77	.	84	.
343	.	.	.	70	.	60	.	Hookworm eggs found in stool.
346	90	.	85	.	.	.	.	.
349	70	.	.	.	80	.	.	.
354	60	.	.	.	.	.	.	.

TABLE I—CONT'D

SERIES OF 74 CASES WITH HEMOGLOBIN ESTIMATION

CASE NO.	HB. ON ADMIS.	MONTHS I	II	III	IV	V	VI	REMARKS
357	.	46	58	61	70	78	.	Postpartum hemorrhage.
352	.	.	.	.	62	.	.	.
361	62	.	90	.	.	.	.	.
363	.	.	67	.	70	.	.	Hookworm eggs found.
369	.	.	80	.	.	.	.	.
371	71	.	.	70	.	.	.	.
376	61	.	60	.	.	80	.	Influenza and pneumonia.
378	.	.	77	.	.	.	.	.
380	45	.	.	76	.	76	.	Mastitis with high fever in II month.
381	.	.	64	78	82	.	.	.
387	100	.	63	.	.	.	.	.
388	54	.	91	.	.	.	.	Wassermann four plus.
393	89	.	78	.	.	90	.	Wassermann four plus.
401	.	.	65	.	71	.	.	Hookworm eggs found.
403	28	.	42	.	.	.	.	Malaria.
404	63	.	76	.	.	.	.	.
405	75	.	80	.	.	.	.	.
406	80	.	70	70	.	.	.	Mastitis with temp. 103 in I month.
407	.	80	.	.	.	.	.	.
408	72	.	.	92	.	.	.	.
410	.	64	.	.	76	.	.	.
413	75	70	90	.	.	.	.	.
415	.	73	.	60	71	.	.	.
421	35	45	48	65	.	.	.	.
422	65	.	80	.	.	.	.	.
423	60	.	.	74	.	.	.	.
424	78	.	78	.	.	.	.	.
225	70	.	.	.	.	.	.	Hb. 67% in the VIII and 71% in the IX Mo.
427	82	.	78	72	.	.	.	Acute tonsillitis in the second month.
428	.	.	78	.	.	.	.	.
430	.	74	.	78	.	.	.	.
430½	.	65	.	.	.	.	.	.
435	70	65	.	.	.	.	.	.
440	.	.	.	80	.	.	.	.
441	.	.	.	70	.	.	.	.
444	75	.	76	.	.	.	.	.
449	.	.	.	71	.	.	.	.
451	72	.	80	.	.	.	.	.
466	.	58	67	.	.	.	.	.
461	.	75	85	.	.	.	.	Malaria.
AVERAGE	68.3	65	72.6	72	72.9	75.5	76.8	

debilitating conditions is due either to an inhibitory effect on the secretory cells of the corpus luteum, or, more probably to the failure of ovulation itself. Why not include pregnancy, labor, and possibly lactation in the debilitating conditions? As recovery takes place ovulation be-

gins anew, and as the resulting corpus luteum matures, menstruation starts again. This, however, may be arrested by the fertilization of the ovum.

The present study was undertaken to see what, if any, was the debilitating effect of child bearing. The percentage of hemoglobin was taken as a measure because, first, it was known to be decreased in pregnancy, and second, its estimation was easy. The analogy of the disturbance of menstruation in chlorosis to the amenorrhea of the puerperium makes the hemoglobin percentage a natural measuring rod for this work. All the determinations were made with the same instrument, a Sahli's hemoglobinometer. The subject material for the study was the best and most intelligent of my private practice together with cases seen at the Spring Street Home. The inmates of this institution must nurse their babies for four months, and for that length of time are under observation. The dispensary patients and the middle class patients cannot often be induced to cooperate in such a study as this. The patients were apparently free from disease except where noted in Table I. All save two had negative blood Wassermanns. Two others, in the second week postpartum, developed aching, fever, and enlarged spleen, and malarial organisms

TABLE II

CASES THAT FLOWED FOR MORE THAN FOUR WEEKS

CASE NO.	HB. ON ADMIS.	I	II	III	IV	V	VI	REMARKS
40	.	.	.	84	.	.	.	.
91	.	.	.	.	.	.	.	Hb. 72% in X month.
174	.	.	.	.	.	.	.	Hb. 61% in VII month.
270	.	.	.	.	62	.	67	.
325	45	.	.	81	.	.	.	.
346	90	.	85	.	.	.	.	.
349	70	.		.	80	.	.	Anteflexed uterus
357	.	46	58	61	70	78	.	.
378	.	.	77	.	.	.	.	Anteflexed uterus.
381	.	.	63	78	82	.	.	Anteflexed uterus.
387	100	.	63	.	.	.	.	Anteflexed uterus.
403	28	.	42	.	.	.	.	Anteflexed uterus.
410	.	64	.	.	76	.	.	.
413	75	70	90	.	.	.	.	Anteflexed uterus.
415	.	73	.	60	71	.	.	.
421	35	45	48	65	.	.	.	Retroflexed uterus.
427	82	.	78	72	.	.	.	Retroverted uterus.
430	.	74	78	.	.	.	.	.
430½	.	65	.	.	.	.	.	.
435	70	65	.	.	.	.	.	Retroverted uterus.
441	.	.	.	70	.	.	.	.
449	.	.	.	71	.	.	.	.
451	72	.	80	.	.	.	.	Retroverted uterus.
466	- .	58	67	.	.	.	.	.
AVERAGE	66.7	62.2	69	71.3	73.5	78	67	

were found in the blood. These cases of malaria were treated with quinine. Cases 357 and 413 were given cacodylate of soda. Otherwise there was no medication that could have had any possible effect on ovulation or menstruation.

Table I gives the entire series of 74 patients with the hemoglobin arranged according to the time it was taken. The first column gives the hemoglobin percentage when the patient was first seen, usually about the middle of pregnancy. The other columns give the percentages in the various lunar months postpartum. You will see at once that, where more than one determination was made in the puerperium, there was a steady increase in the hemoglobin with the following exceptions: Cases 380 and 406 had a stationary hemoglobin, and both cases had mastitis after leaving the hospital. Cases 343, 415 and 427 showed a decline in hemoglobin percentage. The first of these had uncinariasis. The last had an acute attack of tonsillitis between the two examinations. The average hemoglobin percentage for the various periods is suggestive. On admission the average percentage was found to be 68.3 per cent. In the first month postpartum it had fallen to 65 per cent and then there was a steady rise until the sixth lunar month. After this time the figures are too few to give any real average. Thus we see that, both individually and collectively, we have a gradual improvement in the hemoglobin from the first to the sixth month. If we classify the cases according to their behavior towards menstruation, we get quite a different picture. Table II contains all cases that had a bloody discharge for four or more weeks postpartum. This flow is essentially an anatomic one, and differs in its etiology from the menstrual flow, which has its origin in the activity of the corpus luteum. The average readings of these twenty-four cases are lower in the first three columns than those of Table I. Four of these patients, or 16.66 per cent, began to menstruate in the second lunar month. One menstruated in the fifth, and two in the ninth lunar month. In other words, only 37.6 per cent of these patients were menstruating by the end of the sixteenth week postpartum. When we compare this with Table I, or the unclassified cases, we see a marked difference. Of the unclassified cases, 31.1 per cent were menstruating in the second lunar month, 16.2 per cent more in the third, and an additional 6.7 per cent in the fourth lunar month, making a total of 54 per cent who were menstruating in the first sixteen weeks after delivery. Thus we see that patients in Table II are somewhat substandard, as is shown by the slowness with which their endometrii heal, the lower hemoglobin percentages, and the delayed reappearance of the menstrual flow.

Table III gives the cases arranged in groups according to when the resumption of menstruation took place. Group A, or the patients that began to menstruate in the second lunar month, has a slightly higher hemoglobin percentage on admission than Table I. The postpartum rise, however, is more rapid, the figures being: 74, 75.1, 74.5, 77.7, 75, 84. Group B, or the cases that did not begin to menstruate until the third

lunar month, has a much lower antepartum hemoglobin, and the postpartum rise is slower. Groups C, D, E, F and G contain so few cases that they may be disregarded. It is interesting to study the individual cases of this table. In twenty cases the hemoglobin was determined at

TABLE III

CASES CLASSIFIED ACCORDING TO MONTH THEY BEGAN TO MENSTRUATE

CASE NO.	HB. ON ADMIS.	MONTHS I	II	III	IV	V	VI	REMARKS
A. Cases beginning to menstruate in the second lunar month.								
36	.	.	.	75	.	.	.	.
285	85	.	.	.	80	.	.	Retroflexed uterus.
304	.	.	68	.	.	.	.	.
308	55	.	55	70	.	.	.	Anteflexed uterus, stillborn baby.
310	.	.	74	.	.	.	.	Anteflexed uterus.
315	45	.	.	77	.	.	.	.
322	80	.	.	80	.	.	.	.
333	.	.	70	.	.	.	.	Anteflexed uterus.
342	.	.	.	63	77	.	84	Anteflexed uterus.
343	.	.	.	70	.	80	.	.
361	62	.	90	.	.	.	.	Anteflexed uterus.
371	71	.	.	70	.	.	.	Anteflexed uterus.
380	45	.	76	.	76	.	.	Anteflexed uterus.
387	100	.	63	.	.	.	.	Anteflexed uterus.
388	54	.	91	.	.	.	.	Anteflexed uterus.
393	89	.	78	.	.	90	.	Stillborn baby.
408	72	.	.	92	.	.	.	Retroflexed uterus.
423	60	.	.	74	.	.	.	.
424	78	.	78	.	.	.	.	Anteflexed uterus, baby died when one day old.
428	.	.	78	.	.	.	.	Anteflexed uterus.
430	.	74	.	78	.	.	.	.
444	75	.	76	.	.	.	.	Retroflexed uterus, stillborn baby.
449	.	.	.	71	.	.	.	.
451	72	.	80	.	.	.	.	Retroflexed uterus.
AVERAGE	69.5	74	75.1	74.5	77.7	75	84	
B. Cases beginning to menstruate in the third lunar month.								
261	60	.	.	.	.	.	77	Anteflexed uterus.
279	.	.	.	63	.	.	.	.
293	70	.	.	.	.	74	.	Stillborn baby.
325	45	.	.	81	.	.	.	.
346	90	.	85	.	.	.	.	.
381	.	.	63	78	82	.	.	Anteflexed uterus, stillborn baby.
403	28	.	42	.	.	.	.	Anteflexed uterus.
404	63	.	76	.	.	.	.	Anteflexed uterus.
407	.	80	.	.	.	.	.	Anteflexed uterus.
410	.	64	.	.	76	.	.	
435	70	65	.	.	.	.	.	Anteflexed uterus.
AVERAGE	60.9	67.7	66.5	74	79	74	77	

TABLE III—CONT'D

CASES CLASSIFIED ACCORDING TO MONTH THEY BEGAN TO MENSTRUATE

CASE NO.	HB. ON ADMIS.	MONTHS I	II	III	IV	V	VI	REMARKS
		C. Cases beginning to menstruate in the fourth lunar month.						
238	65	.	.	.	.	.	.	Retroflexed uterus.
312	.	.	70	.	.	.	.	.
326	95	.	70	.	.	76	.	.
349	70	.	.	.	80	.	.	Anteflexed uterus.
352	.	.	.	.	62	.	.	.
376	61	.	60	.	.	80	.	Weaned the baby on account of mother's lung condition.
		D. Cases menstruating first in the fifth lunar month.						
337	73	.	.	.	74	.	76	Anteflexed uterus.
354	60	.	.	.	.	.	.	Anteflexed uterus.
357	.	46	58	61	70	78	.	.
		E. Cases menstruating first in the sixth lunar month.						
234	.	.	.	.	.	.	80	.
240	.	.	.	.	.	70	.	.
		F. Cases menstruating the first time in the seventh lunar month.						
225	70	.	.	.	.	.	.	Hemoglobin was 67% in the IX & 71% in the X mos.
		G. Cases that did not menstruate in the first seven months after childbirth.						
91	.	.	.	.	.	.	.	Hemoglobin was 72% in the X month.
254	75	.	.	.	.	.	.	Hemoglobin was 70% in the IX month.
270	.	.	.	.	62	.	67	.
311		.	71	.	.	.	.	.

the time menstruation reappeared. The average percentage of hemoglobin at this time is 74.9 per cent. The extremes are 55 per cent and 91 per cent. The former had a 55 per cent hemoglobin when first seen, and it is possible that her ovaries had become accustomed to functioning in an impoverished medium.

In order to readily fix the attention to the time of resumption of menstruation, I have dropped a perpendicular line in front of the month in which menstruation was resumed. In Group G this line was drawn after all the figures, for the reason that these cases have been followed for seven or more months and have not menstruated. You will see at once that with six exceptions, no figure to the right of the menstrual line is smaller than the percentage of hemoglobin upon admission. The exceptions are Nos. 285, 371, 387, 393, 326 and 225. Of these, Nos. 285, 387, 393 and 326, all had unusually high hemoglobin percentages when first seen, and even a good postpartum hemoglobin would be below these figures. In No. 371 the figures are practically the same. In No. 225 the

explanation is probably the same as in the case with the 55 per cent hemoglobin. This patient had always been anemic, and the ovaries had become accustomed to working in the changed environment. Even the six months postpartum in which the patient was anemic and amenorrheic was a long enough time to accomplish this.

In regard to the effect of retrodisplacement as a cause for the early resumption of menstruation, my data is very limited. It is, however, in accord with Ehrenfest. I have notes in five cases of retroversion as to the time the menstrual flow reappeared, four of them, or 80 per cent, menstruated in the second lunar month, and the remaining 20 per cent in the fourth month. It occurs to me that the pelvic hyperemia incident to the misplacement of the uterus is a factor in hastening ovulation.

The effect of lactation or the lack of lactation does not seem to be so marked. Eleven of my cases, for various causes, death of the baby, condition of the breasts, intercurrent influenza and pneumonia, etc., lactated only a very short time; 45.4 per cent of these menstruated in the second month, and 36.3 per cent in the third month. One, however, did not menstruate for a year. The difference between these percentages and the 31.1 per cent of Table I cases that menstruated in the second month and the 16.2 per cent that began menstruating in the third month, represents, it seems to me, the debilitating effect of lactation, rather than the effect of not having an inhibiting hormone from the functioning breast. If there were any such hormone, its absence in these cases should show bigger results, say something comparable to the effect of retrodisplacement.

CONCLUSIONS

My cases are too few for me to present very decided conclusions. It would seem, however, that hemoglobin is a deciding factor in the postpartum resumption of menstruation. Immediately after delivery there is a definite drop in the hemoglobin from which the patient slowly recovers. The average case begins menstruating when the hemoglobin reaches about 75 per cent. Certain cases menstruate with a much lower hemoglobin, and these are patients who have had some anemia for a long time. Retrodisplacement with its pelvic hyperemia is also a factor in the early restoration of the menstrual phenomena.

REFERENCES

(1) Osler, Sir William: Severe Anemias of Pregnancy and Postpartum State, Brit. Med. Jour., Jan. 4, 1919, i, 1. (2) Thompson, W. L.: The Blood in Pregnancy, Bull. Johns Hopkins Hosp., June, 1904, xv, 205. (3) Bear, J. L.: Leucocytes in Pregnancy, Labor and Puerperium, Surgery, Gynecology and Obstetrics, xxiii, 567. (4) Sundin, O.: Zentralb. f. Gynäk., xxx, No. 7. (5) Jacobius, S.: Arch. f. Kinderheilkunde, xlviii, No. 1. (6) Sanes, K. I.: Am. Jour. of Obstetrics, lxxiii, 110. (7) Ehrenfest, Hugo: The Reappearance of Menstruation after Childbirth, Am. Jour. Obst., lxxii, 577-768. (8) Novak, Emil: The Corpus Luteum. Its Life Cycle and Its Role in Menstrual Disorders, Jour. Am. Med. Assn., lxvii, 1285.

HYPEREMESIS GRAVIDARUM

By Edward Speidel, M.D., Louisville, Ky.

EVERY case of vomiting of pregnancy should be considered with the utmost seriousness. Women are so accustomed to associate nausea and vomiting with a first pregnancy, that the occurrence is made a matter of jest by the associates and friends of the afflicted, and in consequence, only when the condition becomes almost unbearable does a woman present herself for treatment. That the pregnancy itself is the main disturbing factor in the case is evident from the fact that the condition dates from the onset of pregnancy, continues for a definite period during that pregnancy and in extreme cases is checked suddenly with the interruption of the pregnancy. That other conditions may be associated with it and in consequence aggravate the condition, primarily due to the pregnancy, must also be accepted. Every pregnant woman is more or less neurotic, which applies especially to the woman pregnant for the first time. Neurotic symptoms are given in all of the text books as evidences of pregnancy. In a first experience it is natural that the primipara with the fanciful tales that have been told her by her friends, should look upon this new experience with a mixture of fear, dread, and pleasurable anticipation. Her mind is centered upon the organs involved and the sexual element is supplied. She craves more and more the affections of her husband and reflexes between the sexual organs and the digestive system are easily established. Consequently it is wise to consider all cases of hyperemesis as at least toxic and neurotic. A reflex factor in the shape of a displaced uterus or eroded cervix can quickly be eliminated in the early treatment of the case by proper measures of correction. In the means of determining the degree or the seriousness of the toxemia existing in a given case, we are apparently still as much at sea as ever. The contention by Williams, that the ammonia-nitrogen coefficient will serve as an indicator of the kind and degree of hyperemesis does not seem to hold good in all instances. The test is one that is not readily made and as an acidosis is found in most pregnant women, and as inanition itself causes an acidosis, it is difficult to decide whether the urinary condition is due to the toxemia or to the lack of food.

The test may be supposed to be more reliable if Williams' suggestion is followed by the use of copious rectal enemata of sodium bicarbonate solution. If acidosis persists in spite of such treatment, then it may be claimed to be due to the toxemia. The gravity of the condition may then perhaps be determined by the rise or fall of the ammonia-nitrogen coeffi-

cient, if a laboratory for the accurate performance of the test is accessible.

Whether or not Hirst's claim that the nausea and vomiting is due to nonabsorption of corpus luteum during pregnancy is correct is still a mooted question, but as the newer therapy depends upon this hypothesis it should receive consideration. Hirst claims that women are constantly absorbing corpus luteum, as one is developed with each menstrual period. During pregnancy this ceases and the corpus luteum of the last menstrual period increases in size until about the end of the third month, and as it is during this period of nonabsorption of corpus luteum that we have the nausea and vomiting of pregnancy, he claims that this points clearly to a distinct relation between the two.

It seems to the writer that the fallacy in this deduction is in the fact that nausea and vomiting should be associated with every pregnancy as nonabsorption of corpus luteum in accordance with that idea occurs in all.

Investigations by Litzenberg seem to indicate that there is more or less disturbance of liver function in even ordinary pregnancies, as shown by the presence of urobilinogen or urobilin in the urine of such pregnant women, consequently the presence of any of these substances in the urine will not aid us in determining the gravity of a given case of toxemia.

Elevation of temperature with increase in the frequency of the pulse, although indicative of a serious turn in a given case, may be absent in some very serious cases and in consequence cannot be depended upon as reliable symptoms.

When jaundice shows itself, especially icterus of the conjunctiva, such grave liver destruction is already present that interruption of pregnancy may hardly save the patient. With the knowledge that there are no definite tests by which the gravity of a given case can be determined, it has become the custom of the writer to resort at once to extreme measures in the treatment of all such cases.

Absolute isolation of the patient in a well ventilated room and in charge of a competent nurse is the first essential. Banishment of the husband and anxious relatives is such an extremely important factor in the treatment of such patients, that a physician should unhesitatingly retire from any case in which such a request would not be rigidly observed. The writer has seen a number of cases in which the condition improved at once upon the establishment of such an order. Fresh air and sunshine are other accessories that, of course, aid materially in the improvement of the patient to such an extent that in proper surroundings placing the patient in a tent out of doors may be resorted to. In addition, then, absolute rectal feeding is depended upon, not even allowing water by mouth, and in following the suggestion in an article on feeding in hyperemesis by Bacon, a solution on the order of the one mentioned

by him has been used in my cases. It consists of glucose, 50; beef peptonoids, 100; calcium chloride, 0.3; sodium bicarbonate, 3; sodium chloride, 4; and distilled water, 1000.

A beef peptonoid is selected that contains vitamines in place of the 50 parts alcohol as found in the original formulæ, as 100 parts of such peptonoid may be supposed to contain about 50 parts of alcohol.

The calcium chloride is added in order to supply that much needed element, some authors ascribing a great deal of the toxemia of pregnancy to a calcium deficiency.

In addition to this preparation, a solution of sodium bromide, 40 gr., and chloral, 20 gr. to the one-half ounce of water is added to each 1000 c.c. of the above solution.

The bromide and chloral are increased or diminished according to the demands of the individual, the object being to keep the patient in a somnolent state the greater part of the time. At times the bromide-chloral mixture may be omitted from the proctoclysis given during the day and only added to that administered at night.

A rectal irrigation with sodium bicarbonate solution should be given in the early morning and then after that is expelled the proctoclysis of the feeding solution should be begun at the rate of about 60 drops a minute. With the addition of the bromide and chloral the patient will rarely complain of inability to retain the solution, or of rectal irritation. The patients are generally very well satisfied during the days that they are entirely dependent upon this solution for water and nourishment and there is little difficulty in carrying them along in this manner for at least a week. Ever since Hirst advocated the use of extract of corpus luteum in this condition it has been deemed advisable to inject one or two ampoules of the solution intramuscularly each day. It has been used in a number of cases that ended in recovery and it has been used just as faithfully in others in which interruption of pregnancy had to be resorted to, consequently the writer has not been able to form a definite opinion as to its value. Under no circumstances would it be considered wise to depend upon it without the extreme dietary and other restrictions outlined in this paper.

After a week of this regime it should be possible to begin the administration of food and water by the mouth. Gastric lavage with sodium bicarbonate solution had better precede the resumption of oral feeding and then contrary to the usual advice thoroughly cooked cereals, zwieback and toast are better foods to begin with than the generally advocated milk foods. Rectal feeding should be continued intermittently in conjunction with the tentative oral feeding, until the cessation of vomiting and the ability to take food naturally indicate that the condition is safely under control.

If the extreme measures advocated are unsuccessful, then from the experience gained from a number of distressing fatal cases of this kind,

the writer would unhesitatingly interrupt the pregnancy in order to save the life of the mother if possible. A number of cases of late interference with the pathetic death of the young mother has been enough to impress the danger of too late interference, upon the mind of the writer. Interruption of the pregnancy in all instances should be done in two stages if necessary. The insertion of a soft rubber catheter and gauze into the uterus as a preliminary, and then if necessary the emptying of the uterus the next day under nitrous oxide anesthesia with the gloved finger.

One precaution should be taken in the conduct of these cases. It should be generally understood by the profession that the Catholic church does not admit of the interruption of a pregnancy in a member of that faith or in a Catholic institution unless the child is viable. There is absolutely no exception to this rule. Consequently when conducting a case of this kind the patient should either be sent to an institution of a different denomination or if interruption of the pregnancy becomes necessary in such a patient who happens to be in a Catholic hospital then it is futile to argue with the management of that Hospital, and the obstetrician has no recourse except to remove his patient to another hospital that is not subject to such restrictions.

REFERENCES

Emge: Acidosis in Normal Uterine Pregnancies, Am. Jour. Obst. and Dis. Women, Nov., 1916, p. 769. Litzenberg: A Study of Liver Function in Normal Pregnancy, Am. Jour. Obst. and Dis. Women, Feb., 1916, p. 228. Hirst: The Control of the Nausea and Vomiting of Pregnancy by Intramuscular Injections of Corpus Luteum Extract, Am. Jour. Obst. and Dis. Women, March, 1919, p. 327. Williams: Textbook of Obstetrics, ed. 4. Dorman: The Toxemias of Pregnancy, Am. Jour. Obst. and Dis. Women, April, 1918, p. 604. Bacon: Feeding in Hyperemesis Gravidarum, Jour. Am. Med. Assn., 1918, p. 1750.

REPEATED CESAREAN SECTION

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THE late effects of cesarean section are of importance from several aspects, and subsequent laparotomy for any cause affords an opportunity for their study. A repetition of the cesarean section not only permits observations on the general effects of the first section but also offers much of interest in itself.

Both gross and microscopic pathology resulting from the first operation may be studied, with all the bearing which this must have on the questions of whether one cesarean section necessitates others in subsequent pregnancies; whether the high abdominal incision of Davis[1] is to be preferred to the low incision insofar as the relative occurrence of adhesions is concerned; whether or not a woman should be sterilized after two or three operations, and if so on what account; whether or not the suprasymphyseal transperitoneal cesarean section (the Frank method of performing an extraperitoneal cesarean) which opens the lower uterine segment through an oval peritoneal orifice, causes such anatomic distortion as to preclude its being employed more than once. The likelihood of rupture of the uterine scar in subsequent pregnancies may be estimated from its appearance, and it should be of interest to know to what extent existing pathology is aggravated by repeated operations.

While it is realized that sixteen cases of repeated cesarean section are too few to warrant any definite conclusions, it seemed desirable to place on record the observations made while attending these patients, so that at some future time they might be compiled with those of others. A brief bibliography of similar work which has been used for reference in making this study, is appended.[2-11]

DEVELOPMENT OF THE CESAREAN SECTION

Such extraordinary advance in surgical technic has been made since the time of Porro and Sänger, that the classical conservative cesarean is now a comparatively simple and safe operation. This is especially true when, for definite indications, the operation may be performed at an appointed time before labor has begun, or at least shortly after its beginning. Such circumstances are nearly ideal because every precaution can be thrown about the patient, such as the avoidance of vaginal examinations or ill-advised attempts at delivery.

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It is unfortunate that, in spite of the development of aseptic surgery, the Porro operation still has its place in those cases where the necessity for cesarean section has not been recognized until after they have been grossly infected by meddlesome obstetrics or other neglect. The indications and contraindications for the classical cesarean section, on the one hand, and the Porro cesarean section, on the other hand, are so clear-cut and well understood that it is not necessary to enter into them in detail in this paper. Their fields are quite definite and should not overlap to any extent, but until recently there was no middle-ground between the two. In consequence of this, it is unquestionable that the limits of safety have often been exceeded in doing the classical conservative operation, while many uteri have been sacrificed by too great a caution, or fear of an infection which did not exist.

There are, however, many cases which do not fall into either category. A woman might have been examined vaginally several times, or it might have been desirable to give a patient a prolonged test of labor if her pelvis were only moderately contracted, or there might have been one or two attempts at the artificial delivery of a patient, all of which would increase the likelihood of contamination and infection, even though carefully done. Under such circumstances classical cesarean section is distinctly dangerous to a woman, even though the Porro amputation of the uterus might not be definitely required. A long list of similar possibilities and conditions present themselves readily to the mind and make this middle-ground a broad field.

The safety limits of the classical operation have been more sharply drawn, and at the same time, the need for the Porro operation has been limited by the revival by Frank,[12] in 1907, of the old extraperitoneal cesarean section. This operation has been modified extensively since that time, but as DeLee[13] states, all the modifications fall into two classes, the transperitoneal and the true extraperitoneal. Nicholson[14] points out that the term extraperitoneal cesarean section is taken simply to mean that the selected portion of the lower uterine segment through which the infant is to be delivered has been made extraperitoneal before its incision. Nicholson's review and descriptions of the various modifications of this operation are most complete, and for the details of this subject special reference may be made to his paper.

The suprasymphyseal transperitoneal cesarean sections referred to in this paper have been done according to the first technic of Frank, or the second method described by Sellheim which is virtually the same (*vide* Nicholson). In my cases this type of extraperitoneal cesarean section has been chosen whenever contamination, if not actual infection, was suspected. Either this or the Kroenig-Gellhorn operation is ideal for those patients with border-line contraction of the pelvis who have to be given a test of labor, and lately I have employed the latter on all patients

who have been in labor any considerable length of time, even though no vaginal examinations have been made. Morbidity undoubtedly increases in direct ratio to the length of time the patient has been in labor before operation, and the extraperitoneal cesarean offers the additional security that is necessary in these cases.

Briefly, then, it may be said that there are three main types of cesarean section available for three distinct classes of cases. The classical conservative cesarean section is still the most commonly employed, because of the comparative ease and rapidity with which it is performed, and also because the fundus of the uterus is the field exposed by this route, thus making this region available for any other necessary work such as resection of the tubes for sterilization, removal of fibroids, etc. The low, or cervical cesarean section of Kroenig and Gellhorn competes with the classical, except where it is necessary for the fundus to be exposed, and offers much greater security against seepage of lochia into the peritoneal cavity, against postoperative ileus, against adhesions, and against rupture of the uterus in subsequent pregnancies. This makes possible its employment with less strict limitation than the classical.

The extraperitoneal cesarean of Frank may be used with considerable assurance of safety where infection is merely suspected, or is likely to be low-grade in character, whereas, in the presence of actual infection there is no question but that the Porro amputation of the uterus should be performed.

REPORTS OF CASES

The sixteen cases to be presented separate themselves into four main groups, or classes, according to the nature of the surgical intervention.

The first group consists of those patients, ten in number, whose first and second operations were the classical cesarean section, and one patient who had had two classical sections and was being similarly operated upon for the third time. One of the first ten is now pregnant again. The second group is made up of three women whose first operation was an extraperitoneal cesarean section, whereas the second was a classical. A single patient had a classical cesarean section in one pregnancy and an extraperitoneal operation in her next labor. Still another patient had a classical cesarean section in her first pregnancy, and a rupture of the uterus near term in her second pregnancy, for which a supravaginal hysterectomy was done. For the sake of brevity the histories will be summarized and only the salient features presented.

Class I. Repeated classical conservative cesarean section.

CASE 1.—Mrs. M. S., gravida ii, white, aged twenty-six. Coxalgic pelvis. *Measurements*: Intersp. 25 cm.; interer. 25.75 cm.; bitroch. 27.5 cm.; left oblique 22 cm.; right oblique 23.5 cm.; ext. conj. 20.5 cm.; diag. conj. approximately 11 cm.; conj. vera 9 cm. Right-sided coxitis; right thigh cannot be abducted, the head of the

femur being firmly ankylosed; the ileopectineal line bulges into the pelvic cavity on the left side; subpubic angle narrow; oblique contraction of pelvic inlet.

Obstetric history: July 16, 1915. Classical cesarean section at term, after 8 hours of labor. Low vertical incision; afebrile puerperium; living child. Operation was done at another hospital because of which this record is not complete in details. *Second pregnancy*: Second operation. Oct. 25, 1918. Classical cesarean section, resection of portion of tubes and stumps buried for sterilization. Operation was performed at appointed time, before beginning of labor; high incision.

Findings at operation: Numerous dense adhesions between uterus and abdominal wall at site of first operation, which could not be freed; no thinning of scar in uterus. Puerperium uneventful except for elevation of temperature to 101 on two widely separated days. Living child.

Final examination: Dec. 14, 1918, approximately 7 weeks. Uterus poorly involuted and palpable above symphysis and to the right. Vaginal examination discloses adherence between uterus and scar of first operation; fundus drawn to right; no thickening of adnexa; cervix closed and high; vaginal canal lengthened by retraction upward.

CASE 2.—Mrs. P. C., gravida ii, white, aged twenty-three. *Obstetric history*: First pregnancy, breech presentation, manual extraction of dead baby followed by septicemia. *Measurements*: Intersp. 22.5 cm.; interer., 24 cm.; bitroch. 28:5 cm.; ext. conj. 17.5 cm.; diag. conj. 9 cm.; conj. vera 7 to 7.5 cm.

Second pregnancy: First operation; Oct. 24, 1917. Classical cesarean section at term, at appointed time before beginning of labor. High incision; living child; afebrile puerperium. *Third pregnancy*: Second operation; March 8, 1920. Classical cesarean section at term, before beginning of labor. High incision. *Findings at operation*: No adhesions; thick uterus; scar found with difficulty and excised for microscopical examination. Living child, uneventful puerperium. *Final examination, about 6 weeks*: Incision well healed; uterus involuted, retroflexed, but easily brought forward; no adhesions; adnexa free.

CASE 3.—Miss K. H., gravida i, negress, aged twenty. *Measurements*: Intersp. 23.5 cm.; interer. 25 cm.; bitroch. 29.5 cm.; ext. conj. 16.5 cm.; diag. conj. 9.5 cm.; conj. vera 7.6 (Skutsch) cm.; trans. of inlet 11.4 cm. (Skutsch); trans. of outlet 7.5 cm.

First pregnancy: First operation, April 28, 1913. Classical cesarean section at appointed time before beginning of labor. High incision; living child; afebrile puerperium. Positive Wassermann reaction (treatment). *Second pregnancy*: May 12, 1914. Miscarriage at 3 months. *Third pregnancy:* Second operation; June 21, 1916. Classical cesarean section at appointed time before beginning of labor. High incision. *Findings at operation:* Few fine omental adhesions; uterus free; scar plainly visible, but thick; no thinning of uterus in any part. Living child, uneventful puerperium. *Final examination:* About 3 weeks. Uterus well involuted for period of puerperium, antetlexed and freely movable, adnexa free.

CASE 4.—Mrs. W. G., gravida iii, white, aged twenty-two. *Obstetric history:* June 4, 1914; First child born after difficult labor; lived only a few minutes. Patient does not know whether delivery was instrumental or spontaneous. Dec. 4, 1915; second child, spontaneous delivery after long labor, lived 26 hours. *Measurements:* Intersp. 23.5 cm.; interer. 26 cm.; bitroch. 30.5 cm.; ext. conj. 17 cm.; diag. conj. 9 cm.; conj. vera 7 cm.

Third pregnancy: First operation; Dec. 20, 1916. Classical cesarean section at appointed time before beginning of labor. High incision; living child; afebrile puerperium.

Fourth pregnancy: Second operation; May 15, 1919. Classical cesarean section at appointed time before beginning of labor, resection of portion of tubes and stumps buried to effect sterilization. High incision. *Findings at operation:* No adhesions; thick uterus; scar represented only by thickened peritoneum. Living child; afebrile puerperium. *Final examination:* At about 5 weeks. Uterus well involuted and anteflexed; mobility slightly impaired; apparently no adhesions to fundus; adnexa free.

CASE 5.—Mrs. T. E. R., gravida i, white, aged twenty-three. *Measurements:* Intersp. 25 cm.; interer. 27.5 cm.; bitroch. 31 cm.; ext. conj. 17.5 cm.; diag. conj. 10 cm.; conj. vera 8 cm.

First pregnancy: First operation; Aug. 12, 1917. Classical cesarean section after 12 hours of labor without engagement. High incision; living child; mildly febrile puerperium; small stitch abscess in upper end of incision. *Second pregnancy:* Second operation; March 2, 1920. Classical cesarean section shortly after beginning of labor. Definite time had been set but patient went into labor. *Findings at operation:* No adhesions from previous operation, scar difficult to find, but dissected out for microscopical examination; uterus thick. Living child; febrile puerperium; temperature ranging up to 100.8° for two weeks. Small stitch abscess in upper end of wound. *Final examination:* About 8 weeks. May 8, 1920. Incision well healed; uterus high, but well involuted; evidently some adhesion formation holding fundus high, but apparently without attachment to abdominal wall; fair mobility; adnexa free.

CASE 6.—Miss I. B., gravida i, negress, aged twenty. *Measurements:* Intersp. 23 cm.; interer. 26 cm.; bitroch. 30 cm.; ext. conj. 15 cm.; diag. conj. 9 cm.; conj. vera 7 cm. *First pregnancy:* First operation; Jan. 25, 1914. Classical cesarean section after test of 8½ hours of first stage of labor without fixation of head. High incision; living child; afebrile puerperium. *Second pregnancy:* Second operation; Oct. 5, 1916. Classical cesarean section at appointed time before beginning of labor. High incision. *Findings at operation:* Few fine omental adhesions; uterus thick and firm. Living child; afebrile puerperium. No note on final examination.

CASE 7.—Mrs. W. D., gravida ii, white, aged thirty-six. *Obstetric history:* First pregnancy ended with long labor; high forceps; baby died on sixth day with symptoms of intracranial hemorrhage. *Measurements:* Intersp. 22+ cm.; interer. 26+ cm.; bitroch. 29.5 cm.; ext. conj. 19.5 cm.; diag. conj. 11− cm.; conj. vera 9 cm. *Second pregnancy:* First operation; March 29, 1916. Classical cesarean section after 4 hours of labor with no tendency toward engagement of the head. High incision; living child; puerperium mildly febrile. *Third pregnancy:* Second operation; July 3, 1919. Classical cesarean section at appointed time before beginning of labor; resection of portion of tubes and the stumps buried for sterilization. *Findings at operation:* Loop of small intestine adherent to lower end of abdominal scar, narrowly escaped injury by virtue of fact that incision was made slightly to right of scar rather than directly through it. Adhesion resected and raw surface of bowel inverted; uterus thick and scar firm; many omental adhesions. Living child; afebrile puerperium. *Final examination:* At 5th week. No adhesions apparent; uterus well involuted, anteflexed, and freely movable.

CASE 8.—Mrs. J. A., gravida i, white, aged twenty. *Measurements:* Intersp. 23 cm.; interer. 26.25 cm.; bitroch. 28 cm.; ext. conj. 17 cm.; diag. conj. 9 cm.; conj. vera 7 cm. *First pregnancy:* First operation; July 9, 1917. Classical cesarean section shortly after beginning of labor (lateral and anterior overriding of head). High incision; living child; afebrile puerperium. *Second pregnancy:* Second oper-

ation; July 5, 1919. Classical cesarean section at appointed time before beginning of labor. High incision. *Findings at operation:* Uterus thick and firm; no thinning of scar; abdominal cavity free from adhesions. Afebrile puerperium; living child. *Final examination:* At 4 months. Nov. 24, 1919. Scar in abdomen firm and well healed; uterus anteflexed but drawn to left; left tube thickened and tender. Patient complained of tenderness and fullness in left flank. Condition symptomatically relieved in ten days' time by employment of hot vaginal douches, and discontinuance of coitus interruptus.

CASE 9.—L. R.; gravida i, white; aged twenty-one. *Measurements:* Intersp. 26.5 cm.; interer. 27.75 cm.; bitroch. 32 cm.; ext. conj. 18 cm.; diag. conj. 10.5 cm.; conj. vera 8.5 to 8 cm. *First pregnancy:* First operation; July 6, 1918. Classical cesarean section after 17 hours of labor without fixation of head. Operation done by a colleague who employs low vertical incision. Living child; afebrile puerperium. *Second pregnancy:* Second operation, Nov. 8, 1919. Classical cesarean section at appointed time before beginning of labor. High incision. *Findings at operation:* Omentum adherent between uterus and abdominal wall with other adhesions at same site. Torsion of uterus and dense adhesions necessitated uterine incision well over to left. Scar in uterus not visible on account of adhesions, but apparently not thinned. Low grade elevation of temperature (99.5 to 99.8) up to fifth day. On this day the elevation went to 101.8, continuing in this neighborhood for nine or ten days, then subsiding gradually. Pyelitis was responsible for part of this fever. Living child. *Final examination:* At 4 weeks. Dec. 4, 1919. Cervix high; uterus well involuted, movable, not tender, and some thickening to the left. Abdominal wound well healed. Patient is now pregnant for the third time, but has not yet come to operation.

CASE 10.—Mrs. H. W., gravida v, white, aged twenty-seven. *Obstetric history:* First pregnancy, 1912; miscarriage at 3 months. *Second pregnancy:* First operation; 1914. Classical cesarean section at another hospital after 14 hours of labor. Incision half above and half below umbilicus. Character of puerperium unknown. Child was puny and died at 9 months of pneumonia. *Third pregnancy:* 1916; miscarriage at 3 months. *Fourth pregnancy:* 1917; miscarriage at 3 months. *Fifth pregnancy:* Second operation; Admitted to Western Pennsylvania Hospital after having been in labor about 24 hours. Head unengaged. *Measurements:* Intersp. 24.5 cm.; interer. 28 cm.; bitroch. 30.75 cm.; ext. conj. 16.5 cm.; diag. conj. 10.75 cm.; conj. vera 8.5 cm.; trans. of outlet 10 cm. *Operation:* Classical cesarean section. High incision. *Findings at operation:* Scar in uterus visible and fairly thick; no abdominal adhesions. Infant was about two weeks premature, apparently suffering from atalectasis, and died shortly after birth. Syphilis suspected but not confirmed. Moderate postoperative atony of the intestines; febrile puerperium. *Final examination:* Aug. 20, 1919. Uterus well involuted, anteflexed, freely movable, and adnexa free. Right ovary somewhat enlarged and tender. Abdominal wound well healed.

CASE 11.—Mrs. H. M., gravida iv, white, aged thirty-one. *Measurements:* Intersp. 23 cm.; interer. 25 cm.; bitroch. 30.5 cm.; ext. conj. 19 cm.; diag. conj. 10.25 cm.; conj. vera 8 to 8.5 cm.; trans. of outlet 6 cm.; subpubic angle very narrow; pelvic cavity narrow, funnel-shaped. *Obstetric history:* First parturition; 1917, in France; forceps, deep lacerations, baby badly bruised, lived 14 months, but was sickly from birth. Febrile puerperium, with phlebitis. *Second pregnancy:* First operation; 1910, in Panama. After an attempt to induce premature labor, at 8 months, by packing the cervix, the gauze being left in place for three days, a classical cesarean section was performed. Febrile puerperium with phlebitis. Child delivered prema-

turely, but survived. *Third pregnancy:* Second operation; 1915. Patient was staying at a popular sanitarium in an Eastern resort in this country, and at about the seventh month made plans to return to her home. The house physician decided that a cesarean section was necessary immediately "because the baby had pushed its elbow almost through the uterus." Classical cesarean was performed, and the tubes were ligated to prevent further pregnancies. The infant died soon after birth, being premature. Phlebitis. *Fourth pregnancy:* Third operation. Patient entered Hospital at about the thirty-sixth week of pregnancy, on account of the danger of uterine rupture, and because of pain and discomfort in the lower abdomen. May 29, 1918, a classical cesarean section was performed two weeks before term, at an appointed time. Tubes ligated; small portion excised and stumps buried to prevent further pregnancies. *Findings at operation:* No evidence of ligation of tubes in preceding pregnancy. Two distinct scars in uterus; uterine wall thinned out in region of former operations; many adhesions, both dense and fine, over uterine scars; lower abdomen filled with adhesions between lower uterine segment and both intestinal and parietal peritoneum, especially on the left side. Living child; acute postoperative dilatation of stomach and intestines which required active treatment for three days; febrile puerperium; recovery. *Final examination:* At 6 weeks. Abdominal incision well healed, uterus fairly well involuted, drawn to left with some fixation and considerable tenderness; some thickening on the left; adnexa tender on right but without thickening; general condition good.

Class II. Extraperitoneal cesarean section followed by classical cesarean section.

CASE 12.—Mrs. M. P., gravida iv, white, Austrian, aged twenty-six. *Obstetric history: First pregnancy;* stillbirth; instrumental delivery of large baby after long labor. *Second pregnancy:* Premature infant (8 months); spontaneous delivery; infant lived 16 days. *Third pregnancy;* parturition at full term, spontaneous delivery after long labor, moderate-sized baby which lived 48 hours. *Fourth pregnancy:* First operation; on admission Jan. 12, 1913, patient had been in labor several hours, during which time family physician had made several attempts at instrumental delivery and then tried to perform a version. Left mento-anterior variety of a face presentation. Head freely movable above the pelvic brim. Fetal heart sounds strong and regular. Patient's temperature 98.8 pulse 114. *Measurements:* Intersp. 24.5 cm.; interer., 23 cm.; bitroch. 28 cm.; ext. conj. 16.25 cm.; diag. conj. 8 cm.; conj. vera 6 cm.; trans. of outlet 7.5 cm. Rachitic bony frame; square forehead; bowed legs; funnel-shaped chest. *Operation:* Extraperitoneal cesarean section (transperitoneal method of Frank), gauze drainage. Febrile puerperium for eight days; culture from cervix showed streptococci; deep infection of wound; recovery. Child in good condition on delivery. A forceps wound on the cheek developed into a gangrenous slough and the child died on the seventeenth day. *Fifth pregnancy:* Second operation; April 15, 1914; about three weeks before term patient applied for admission to the Western Pennsylvania Hospital because of fairly free bleeding. Examination disclosed a central placenta previa. Classical cesarean section performed immediately. High incision. *Findings at operation:* Abdominal cavity free from adhesions. Careful exploration of lower abdominal cavity showed no definite pathology. The line of reflexion of the peritoneum which had been made by the operation into a utero-parietal fold, was well up on the lower portion of the anterior surface of the uterus. This fold represented the peritoneal suture-line of the operation and extended well over into either flank, being almost ligamentous in formation. There was some density below its middle point, but there were no irregular masses. The bladder could not be palpated, the point of reflexion being highest just above the bladder region. Febrile puerperium beginning on the fourth day, continuing so for

nine days. Evidence of lighting up of old infection with some induration beneath scar of extraperitoneal operation. Considerable postoperative atony of bowels. Probably some pelvic peritonitis. Living child. *Examination on discharge:* About 4 weeks. Vaginal walls relaxed, cervix bears old lacerations; uterus poorly involuted, straight and high; fundus movable. Lower uterine segment adherent in region of first operation.

CASE 13.—Mrs. M. H. B., gravida i, white, aged thirty-five. *First pregnancy:* First operation; admitted March 20, 1916, after unsuccessful application of forceps and attempt at delivery by family physician at home. *Measurements:* Intersp. 26 cm.; interer. 29 cm.; bitroch. 30 cm.; ext. conj. 18.5 cm.; diag. conj. 10 cm.; conj. vera 8 cm. Subpubic angle narrow; promontory of sacrum easily reached. Well marked lower uterine segment, Bandl's ring half-way to naval. Right position; head flexed, freely movable; lateral and anterior over-riding; fetal heart sounds 150 and of good quality. *Vaginal examination:* Marked edema of vulva and anterior vaginal wall; os about two to three inches in diameter; large caput succedaneum; unfixed head. Maternal pulse 112; temperature 98.8. *Operation:* Extraperitoneal cesarean section (transperitoneal method of Frank); living infant in blue asphyxia, but easily resuscitated. Gauze drainage through abdominal wound; suppuration of drainage wound (B. coli communis, streptococci and staphylococci). *Examination on discharge:* April 15, 1916. Uterus well involuted and movable; organ fairly low in pelvis but attached in lower segment. Cervix admits tip of finger; adnexa free; some thickening in abdominal wall at site of incision (transverse Pfannenstiel). *Second pregnancy:* Second operation; June 13, 1918. Classical cesarean section at appointed time, near term but before beginning of labor. High incision. *Findings at operation:* The abdominal cavity was free from adhesions. The line of reflexion of the parietal peritoneum from the surface of the uterus was high; the area over the bladder being fairly firm. The peritoneal fold formed by the suture-line extended well out into the flank on either side. No evidence of peritonitis having followed the first operation. Afebrile puerperium; living child. *Examination on discharge:* At 3 weeks, June 22, 1918. Uterus well involuted for this period of the puerperium; anteflexed; fundus freely movable; adnexa free; some fixation of lower uterine segment; no adherence of fundus to upper abdominal wound.

CASE 14.—Mrs. H. H.; gravida iv; white; aged twenty-seven. *Obstetric history: First pregnancy;* miscarriage at 3 months. *Second pregnancy;* May 7, 1913, forceps delivery after difficult labor, living child. *Third pregnancy;* Sept. 27, 1914, forceps delivery after long labor, living child. *Fourth pregnancy:* First operation; patient admitted to Hospital Oct. 6, 1916, after a diagnosis of face presentation. Forceps had been attempted in the patient's home, after which her physician tried to perform an internal podalic version. Both attempts failed, and upon admission the face was still presenting, with the chin posterior and impacted into the pelvic brim with a large caput succedaneum formation. Cervix almost completely dilated but not retracted, with edematous lips. Condition of both mother and fetus was good. *Measurements:* Intersp. 28.5 cm.; interer. 30 cm.; bitroch. 33.5.; ext. conj. 19 cm.; diag. conj. 10 cm.; conj. vera 8 cm. *Operation:* Extraperitoneal cesarean section (transperitoneal method of Frank). Gauze drainage. Living child. Febrile puerperium for six days. No record of final examination. *Fifth pregnancy:* Second operation; Dec. 14, 1918. Fetus in oblique presentation; head lower left quadrant; patient near term but not in labor. Classical cesarean section by high incision, portion of tubes excised and stumps buried for sterilization. *Findings at operation:* The findings in the lower part of the abdominal cavity were practically the same in this patient as in those of the two preceding cases. There was no evidence of

peritonitis having followed the operation, or was there any great anatomic distortion except for the high peritoneal reflexion from off the surface of the uterus at about the junction of the upper and lower uterine segments. The site of the incision into the lower uterine segment was dense and firm. Living infant; afebrile puerperium; patient discharged on seventeenth day. *Examination on discharge:* Dec. 31, 1919. Cervix high; vagina lengthened; uterus still large. Fundus to right and mobility restricted. Some fixation of the uterus to the lower end of the last incision.

Class III. Classical followed by extraperitoneal cesarean section.

CASE 15.—Mrs. P. P.; gravida vii; white; Polish; aged thirty-one. *Obstetric history:* First parturition; craniotomy on dead infant; second labor, decapitation; third pregnancy, miscarriage; fourth gestation, decapitation; fifth labor, decapitation; sixth parturition, brow presentation, forceps, died soon after birth. Details of these events were difficult to obtain on account of patient's imperfect knowledge of English. *Seventh pregnancy:* First operation; admitted to the Western Pennsylvania Hospital July 21, 1911, after having been several hours in labor. The record of this case is incomplete, but a classical cesarean section was done through a low incision by the then obstetrician of this Hospital. The baby was deeply asphyxiated, but resuscitated and did well for 36 hours, after which it began to fail and died on the third day. Febrile puerperium. *Eighth pregnancy:* Second operation; June 21, 1913. Patient sent to Hospital by a doctor who had applied forceps both before and after consultation with two other physicians. Fetal heart sounds about 170, slightly irregular and of only fair quality, becoming slowed at times. L. O. A. of vertex, head partly deflected, freely movable above brim. *Measurements:* Intersp. 30 cm.; interer. 31 cm.; bitroch. 32.5 cm.; ext. conj. 17 cm.; diag. conj. 8.5 to 9 cm.; conj. vera 6.5 to 7 cm.; trans. of outlet 8 cm. *Operation:* Extraperitoneal cesarean section (transperitoneal method of Frank); stillborn infant, gauze drainage. Febrile puerperium for five days with slight suppuration of wound which disappeared promptly. Culture from cervix showed gram negative bacilli, while the incision showed gram positive cocci. *Examination on discharge:* About 3 weeks. Pelvic floor relaxed; stellate laceration of cervix; uterus fairly well involuted, in midposition, adherent near lower segment to anterior abdominal wall, tender, movable, no masses. Patient refused further attention, having become suspicious of our profession! The fundus of the uterus was not exposed in doing the extraperitoneal operation so that no conclusions can be drawn from this case regarding any pathology which may have existed as a result of the first operation.

Class IV. Classical cesarean section followed by rupture of the uterus.

CASE 16.—Mrs. M. H. C., gravida i, white, aged thirty-three. *Measurements:* Intersp. 24.5 cm.; interer. 28 cm.; bitroch. 33 cm.; ext. conj. 18.5 cm.; diag. conj. 10 cm.; conj. vera 8 cm. Admitted to Hospital early in March 1917, for pre-eclamptic toxemia. Fairly rapid improvement under treatment. *First pregnancy:* First operation; March 28, 1917. Classical cesarean section after 11½ hours of labor without engagement of the head. High incision. Vaginal examination had shown cervix to be 2½ inches in diameter. Child living. Patient nauseated and vomiting, definite postoperative ileus by evening. Complete relief from acute condition within 48 hours after delivery following appropriate treatment. Puerperium mildly febrile. *Final examination:* May 10, 1917. Abdominal wound well healed, uterus fairly well involuted, anteflexed, freely movable, adnexa free. *Second pregnancy:* Estimated date of confinement in this pregnancy about June 18, 1918. Pregnancy without abnormality until June 2, 1918. At 3 A.M. on this date, patient was awakened by a sudden sharp pain in abdomen, accompanied by excessive fetal movements

which soon ceased entirely. Constant pain followed. No bleeding. Patient did not enter Hospital until noon, this being nine hours after onset, and was transported several miles from a nearby town, in an ambulance. *Examination:* Abdomen flat, very tender, fetal parts near surface and readily palpated, no movements or fetal heart sounds. Fluid dullness in flanks shifting with change in position of patient. Pulse 96, some pallor, leucocytes 16,000, red corpuscles 5,000,000, hemoglobin 80, urine negative. *Operation:* A diagnosis of ruptured uterus with extrusion of fetus into the abdominal cavity was confirmed by operation. Infant, placenta, and considerable blood mixed with amniotic fluid were found in the abdomen, while the uterus had contracted down so tightly as to shut off the bleeding points in the rent through which the uterine contents had escaped. The rupture was about two and one-half inches in length in the anterior wall of the uterus at the site of the cesarean section. Supravaginal hysterectomy was done, although the rent in the uterus could have been repaired. It was felt that this was the safest procedure rather than to submit this patient to a similar risk if she became pregnant again. The patient was returned to bed in excellent condition. Febrile puerperium for four days. The uterus showed no increase in fibrous tissue in the sections from the edges of the rent. It seems conclusive that the uterine wound had not united properly, and must have been thin, because the rupture included the entire scar and occurred while the patient was quietly resting, rather than exerting herself. This would indicate that this pregnancy had stretched the weak scar to the point where it could withstand no more tension. *Examination on discharge:* Stump movable, few posterior adhesions, pelvis free from masses. General condition good.

ANALYSIS OF CASES

Indications for Operation.—The invariable indication for operation in the cases reported, was dystocia due to contracted pelvis, so that the subsequent operation was as necessary as the first. The degree of contraction was moderate, or "borderline" in seven patients (six from Class I and one from Class IV), on which account these women were deliberately allowed to go into labor before their first cesarean section, in the hope that a few hours of first stage pains would either mould the head into the pelvis, or at least, that enough of a tendency toward engagement would be apparent to warrant a further test of labor.

Time of Operation.—Three women had their first operation done at an appointed time, before the beginning of labor; while a fourth, for whom this was planned, was operated upon shortly after the commencement of her labor. Reoperation was done at an appointed time, before the beginning of labor, in nine patients, shortly after the beginning of labor for one patient, and one other patient failed to enter the Hospital for her second cesarean until after she had been in labor for about twenty-four hours.

Mortality.—Nil. Eleven children were born alive by a first operation on my service. One that was delivered by extraperitoneal cesarean section after attempts had been made at instrumentation outside the Hospital, developed a gangrenous slough from a forceps wound on its cheek and died on the seventeenth day.

At reoperation, thirteen children were born alive, and survived. One

child died a few hours after birth (Case 10, a classical cesarean section), one child was stillborn (Case 15, an extraperitoneal cesarean section), and the child of Case 16, which was extruded into the abdominal cavity through a rent in the uterine wall, was stillborn.

Morbidity.—In studying the character of convalescence from cesarean section, the first ten cases of Class I may be compared with each other. Before their first operation six of these women were given a "test of labor" ranging from four to seventeen hours. Two of these women had a febrile convalescence; three of them were without fever, and the character of the puerperium of the other is not known. Four women of Class I, whose operations were done at an appointed time, made uneventful recoveries.

At reoperation nine of the original ten women were taken before their labor had begun, and one of them came into the Hospital after having been in labor 24 hours. Seven of the nine cases recovered without difficulty, while the last woman mentioned, as well as two others, had a febrile convalescence. One of them had a stitch abscess which accounts for at least part of her trouble, while the other was a patient whose first puerperium was afebrile but who had, nevertheless, a mass of adhesions between the uterus and the abdominal scar of a low incision.

Case 11 who had had two classical cesareans before the one reported here, was infected at each parturition, had an abdomen filled with adhesions, and there resulted either a reinfection or a lighting up of old infection of her last operation. A similar experience occurred with the patient (Case 12) who had had an extraperitoneal cesarean section followed by a stormy convalescence, to return in her next pregnancy with a central placenta previa. After reoperation there was evidence of a lighting up of the old infection with cellulitis beneath the original scar. It should be noted in this connection, however, that the other two cases in Class II (extraperitoneal followed by classical cesarean) made afebrile recoveries from the second operation in spite of the fact that there had been considerable local disturbance at the first.

The danger resulting from a "test of labor" and even a mild infection is emphasized by the patient (Case 16) who was allowed to be in labor 11½ hours, during which time I made a vaginal examination. Following a classical cesarean section, this patient's puerperium was mildly febrile. She had, also, moderate postoperative ileus for the first two or three days which, probably, indicates that she had some peritonitis. Late in her next pregnancy her uterus ruptured through the scar of the first operation.

Findings at Operation.—(1) Adhesions: It was found at reoperation that six of the eleven patients making up Class I had abdominal adhesions. In two of these patients, the adhesions were fine and insignificant, whereas in one woman a loop of small intestine was attached to the

abdominal wall at the lower end of the scar. The remaining three women showed dense adhesions in the lower abdomen which were so located that they appeared to have resulted from the low abdominal incision which had been employed for their first operation. Two of the six had a febrile puerperium, and four of the six were given the "test of labor." On the other hand, one patient whose puerperium was febrile showed no adhesions. One case was particularly striking, in that a low incision had been employed and the patient made an afebrile recovery. At reoperation it was found that a mass of dense adhesions had formed between the uterine wound and the abdominal wound of the first operation. The adhesions could not be separated and a fresh incision was made into the uterus. The patient's puerperium following this operation, however, was stormy with elevation of temperature for days.

(2) Scar in uterus: The uterine scar was thick and plainly visible in six instances; found with difficulty in three; not visible on account of dense adhesions in one; and markedly thinned in one (Case 11). In one case it ruptured late in pregnancy. Microscopic examination of three scars, including that of the ruptured uterus, showed an increase in fibrous tissue in only one instance. There was no increase in fibrous tissue in the ruptured uterus, the scar having undergone muscular regeneration. Reference should be made here to the exhaustive work of Losee[15] in connection with the anatomic study of the cesarean section scar.

(3) Anatomic distortion after extraperitoneal cesarean section: The anatomic findings in these cases have been described in the case histories. I believe it would have been possible to have done another extraperitoneal cesarean section, in each case, through the scar of the first operation, probably without opening the peritoneal cavity. Great care would have been necessary, however, to safeguard the bladder.

A conclusion may be drawn from the three extraperitoneal operations described that this is the operation of choice when infection or contamination is suspected. The risk taken in not doing a Porro operation for each one of these scars, was greater, possibly, than it should have been, but the results obtained were satisfactory. Furthermore, a number of cases similar to these have done well in this clinic after extraperitoneal cesarean section. If infection is plainly evident, or a certainty at the time of operation, there is no question but that a Porro operation is imperative.

Sterilization of patient.—Sterilization has never been performed in this clinic at the first cesarean section, unless this method of delivery was chosen for the express purpose of accomplishing this on account of some such condition as kidney of pregnancy. Four of the sixteen patients were sterilized; three after the second and one after the third cesarean section. This was done by request for three of the women, whereas, it was advised for the fourth (Case 11). In retrospect; it may be said

that of the three, Case 1, required it most on account of adhesions; Case 4 deserved it because this was her fourth pregnancy, her second cesarean, and second living child. Case 7 did not actually require sterilization but earnestly desired it. She is the patient in whom the intestine was adherent to the abdominal wall and narrowly escaped being injured by the incision for the second cesarean section. It is a well-known fact that sterilization cannot be assured unless a small portion of each tube is excised, it being well to use the cautery for this purpose, after which the uterine end should be buried beneath the folds of the broad ligament. Mere ligation is not sufficient and this is well illustrated by the results following the ligation of the tubes of Case 11 at her second cesarean section. Nothing could be seen at her third operation which would indicate that the tubes had been tied off, and she was sterilized by proceeding in the manner described above.

Findings at Discharge Examination.—Five of the eleven patients listed in Class I showed evidence of impaired mobility and adhesion formation when examined for discharge. Three of the five cases were patients in whom this was to be expected, inasmuch as there had been adhesions resulting from their first operation according to the findings at reoperation. Two of them had been found free from this condition, so that the difficulty discovered at their final examination must date from their second operation.

SUMMARY

1. The method of cesarean section to be employed in a given case depends upon the conditions and circumstances surrounding the case. The choice may be made between the classical conservative cesarean, the low cervical cesarean of Kroenig-Gellhorn, the extraperitoneal cesarean of Frank, and the Porro cesarean section.

2. Good results follow the performance of cesarean section either before labor has begun, or soon after its commencement.

3. Repeated cesarean section is a comparatively safe operation if done under proper circumstances, both maternal and fetal mortality being low.

4. There seems to be a definite relationship between the occurrence of fever during the puerperium and the formation of abdominal adhesions.

5. "Test of labor" is often followed by a febrile puerperium.

6. Adhesion formation between the uterus and the abdominal wound occurred in each of the three cases in this series in whom the low abdominal incision was employed. Results in this respect from the high incision of Davis for classical cesarean section are greatly superior.

7. Careful coaptation of the edges of the uterine wound, from the endometrium out, will, in the absence of infection, insure a firm, thick union, in which there is a tendency to muscle regeneration.

8. Rupture of the uterus is a possibility in each repeated pregnancy, but is unusual unless there has been infection in the puerperium of a preceding pregnancy.

9. Extraperitoneal cesarean section is the operation of choice when contamination or infection is suspected. The anatomic distortion following this operation is not great, although quite definite.

10. Sterilization of a patient is inadvisable at the first cesarean section unless some special reason exists for it.

11. Sterilization after repeated cesarean section must depend upon the needs, pathologic and otherwise, of the individual case.

12. Mere ligation of the tubes is not sufficient for sterilization. A portion should be resected and the stumps buried to insure success.

REFERENCES

(1) Davis: Modern Methods in Cesarean Section; Bull. Lying-In Hosp., 1912, viii, 225. (2) Ferré: Sur une série d'opérationes césariennes récentes. Ann. de gynéc. et d'obst., 1914, xli, 160. (3) Rohrbach: Nachuntersuchungsresultate nach extra- und transperitonealem Kaiserschnitt. Ztschr. f. Geburtsh. u. Gynaek., 1914, lxxv, 530. (4) Walls and Shaw: Three Cases of Rupture of Pregnant Uterus Through the Scar of a Former Cesarean Section. Jour. Obst. and Gynaec., Brit. Emp., 1914, xxvi, 232. (5) Bell: Rupture of Uterus in Cesareanized Women. Am. Jour. Obst., 1916, lxxiv, 950. (6) Rongy: Rupture of Cesarean Scar. Am. Jour. Obst., 1916, lxxiv, 954. (7) Findley: Rupture of the Scar of a Previous Cesarean Section. Am. Jour. Obst., 1916, lxxiv, 411. (8) Davis: Cesarean Section: A Study of a Consecutive Series of Cases. Am. Jour. Obst., 1913, lxviii, 1017. (9) McIlwraith: Thirty Cases of Cesarean Section. Surg., Gynec., and Obst., 1918, xxvii, 495. (10) Verdelli: Repeated Cesarean Section. Rassegna d'ostet. e ginec., 1914, xxiii, 83, 160, 201. By Intern. Abstr. Surg., 1915, xx, 70. (11) Baum: Erfahrungen mit extraperitonealem Kaiserschnitt. Deutsch. med. Wchnschr., 1913, xxxix, 212. (12) Frank: vide Nicholson (reference 14). (13) De Lee: The Newer Methods of Cesarean Section. Jour. Am. Med. Assn., 1919, lxxiii, 91. (14) Nicholson: The Extraperitoneal Cesarean Section. Surg. Gynec., and Obst., 1914, xviii, 244. (15) Losee: The Cesarean Scar: An Anatomical Study. Bull. Lying-In Hosp., 1918, xi, 228.

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IN MEMORIAM

DR. THOMAS B. EASTMAN

By Dr. O. G. Pfaff

AGAIN the Reaper Death has entered our fold and has taken from among us one in the height of his physical and mental powers, one whose usefulness was at its zenith.

Dr. Thomas B. Eastman was my neighbor and friend and it was my mournful privilege to be one of those who bore him to his last resting place. His death, following a prolonged illness, occurred at his country home near Richmond, Ind., on November 10, 1919.

Dr. Eastman was born at Brownsburg, Ind., on the eighth of April, 1869, and came with his parents to Indianapolis when a small boy. His early educational training was received in the public schools of Indianapolis, and he then entered Wabash College and in 1890 was graduated from that institution. Having carefully prepared himself for the study of medicine he entered the Central College of Physicians and Surgeons at Indianapolis, from which institution he received the degree of Doctor of Medicine in 1893.

After extensive postgraduate work, covering several years in this country and Europe, he returned to Indianapolis and was for some years associated with his father, the eminent pioneer surgeon Joseph Eastman, in the operative work of the Eastman Hospital, an institution devoted to surgery. Here he soon began to demonstrate that skill which was destined to bring him such wide recognition and an extensive practice throughout Indiana and the neighboring states.

He was a fearless operator, but he was also conspicuously known as a careful and conservative surgeon who always held in his mind the best interests of those who entrusted themselves to his care.

He was for several years president of the Indianapolis Board of Health and was the instigator of some very valuable movements in the development of the Indianapolis City Hospital and gave much of his busy time to the welfare of that institution. For many years he was Clinical Professor of Gynecology in the Indiana University School of Medicine, and until ill health overtook him he served faithfully and well in that institution. He was president of the Indianapolis Medical Society for the year 1914 and did much to render that year one of the most prosperous

in the history of the local society. He was an active member of the State and American Medical Associations and was a Fellow of the American College of Surgeons. For twenty years he had been a Fellow of this Association, and in that time contributed numerous papers and discussions at our annual meetings, which he never failed to attend unless kept from so doing by some imperative and conflicting duty.

In his friendship he was devoted and affectionate and similarly he was frankly open in his dislikes. He never courted antagonisms but was always ready to defend any cause or attitude which he had assumed. He was generous in all his instincts and enacted many deeds of charity, a knowledge of which never passed the family circle.

On the twenty-second of March, 1893, Dr. Eastman was married to Miss Ota Beal Nicholson, of Crawfordsville, Ind. A son was the result of this union. Mrs. Eastman died in 1910 and six years later Dr. Eastman married Miss Dorothea Penny, of Dayton, Ohio, who survives him. He was a fond husband and father and aside from his devotion to his profession his whole happiness was found in his home and in directing the education of his son, Nicholson, who, following in his father's footsteps, is now a senior student in the college in which his father was for many years an eminent teacher.

In his death this Association mourns the loss of a Fellow who on many occasions has contributed his valuable aid to the success of our meetings and the advancement of our great cause. We shall long miss his kindly smile and hearty hand-shake which was wont to make us glad that he was one of us.

Dr. John Young Brown.

IN MEMORIAM

ON THE DEATH OF DR. JOHN YOUNG BROWN

By Dr. Francis Reder

ON Nov. 3, 1919, I journeyed with sorrow to accompany with others the remains of a dear friend to his last resting place.

On this journey sorrow unfolded to me much in life which had been dark. It is hard, very hard, after you have toiled mentally and physically, and have succeeded in launching your ship with all sails well set, gliding along upon a placid sea, yourself imbued with a contentment well earned,—then to hear the voice of Charon hailing you with the summons that he has orders to ferry you across the river Styx! Ah, this is the summons we obey! What happened to Dr. Brown must be looked upon as one of the sublime tragedies of life. It was enacted in accordance with the laws of God; the sorrow it creates must be borne with courage. We cannot tell, we do not know, which is the greater blessing, Life or Death. We cannot tell whether the grave is the end of this life, or the door to another, or whether the night here is somewhere else a dawn; neither do we know which is the more fortunate, the baby dying in its mother's arms before its lips have learned to form a word, or he who journeys to the end of Life's uneven road, painfully and slowly taking the last steps with staff and crutch.

Dr. John Young Brown died young, but of this we must not speak. As long as the cradle asks "whence" and the coffin "whither", such problems will remain unsolved on this mundane sphere.

Dr. Brown was a physician of fortune. I see him as the president of the American Asscciation of Obstetricians and Gynecologists. I see him as the president of the Southern Surgical and Gynecological Association. I hear him present a paper of truly scientific merit, and I hear him discuss the scientific subjects of others with all the fervor and courage of a physician who knows what he is talking about. Dr. Brown had many interests. He was broadminded and singularly free from the petty jealousies and narrow prejudices, those vicious and venomous microbes which gain entry so insidiously into our system and almost eat our hearts out before we realize it. He had a most engaging personality. It inspired the trust and confidence of his patients and the faith of the physicians with whom he came in contact. In this happy trait reposed much which made him such a successful physician and such a beloved man. To those

of us who had the good fortune to know him well and enjoyed his love and friendship, the man himself meant more than anything else. He had a most attractive manner, his disposition bordering almost on that of feminine sweetness. His loyalty to his friends was such that nothing could shake it, and the thoughtful kindness for those with whom he came in contact made him one of the best loved men it was our good fortune to know. Throughout his life, in sunshine and in shadow (and like all of us Dr. Brown had some clouds hanging over his head), he was the same true gentleman. The death of Dr. John Young Brown has made a void in the medical profession which will be hard to fill, but it made a void in the hearts of his friends that will never be filled.

Dr. J. Henry Carstens.

IN MEMORIAM

DR. J. HENRY CARSTENS

By Dr. John N. Bell

JOHN Henry Carstens, founder, ex-president, and one of the most active and enthusiastic members of our Association, died August 7th, 1920, at his home in Detroit, after an illness of several months.

Born in Kiel, Germany, June, 1848, Dr. Carstens came to America in the early years of his life, his parents locating in the vicinity of Detroit where he received his education in the Public Schools and German-American Seminary. His medical education was received in the Detroit College of Medicine, from which institution he graduated in 1870. By dint of hard work, and an indomitable will, Dr. Carstens rapidly forged his way to the front ranks of his profession so that at the time of his death he bore an international reputation as a skillful surgeon and successful teacher, was president of the faculty of his Alma Mater and without a doubt the most highly esteemed member of his profession in the State of Michigan.

As a token of the respect and esteem in which he was held by the profession of Detroit, at a recent dinner tendered him in honor of the completion of his fiftieth year of active practice, over two hundred physicians and surgeons were present and by way of speech and kindly salutation expressed their sincere admiration for this truly great man.

Dr. Carstens' hobby was teaching. He was never quite so happy as when pounding home some truth in medicine to a body of interested students or practitioners.

Although he enjoyed an unusually large practice in surgery and consultation, Dr. Carstens was not wealthy, the question of financial remuneration for his services being always secondary to that of the welfare of his patient.

Dr. Carstens was intensely interested in the world wide warfare against cancer, and never lost an opportunity, in and out of season, to warn women especially against the insidious nature of this dread disease.

Notwithstanding a constant activity in the practice of his profession, Dr. Carstens still found time to be closely in touch with civic affairs in Detroit and Michigan, having at one time been a candidate for Mayor and even at the time of his death was an active member of the City Plan Commission.

A loving father and husband, he will be missed most, of course, by his own family, but he will also be missed, for many years to come, in medical circles in Detroit, and State and National medical conferences where he was so well known and highly esteemed.

To the members of this Society it seems hardly necessary to reiterate what is so well known to you all. His virile personality, his rugged honesty, his forceful antagonism in debate and with all his kindly smile and hearty salutation—these and many other characteristics had endeared him to us all.

To those who were more intimately acquainted with him, an even more tender bond of affection existed, for to know Dr. Carstens intimately was to love him.

And so it can be truly said of Dr. Carstens that his was a life of real service, and in the final summing up, if the estimate of a man's success is based upon the amount of service rendered to his fellow-men, then Dr. Carstens was indeed a monumental success.

Dr. Emery Marvel.

IN MEMORIAM

DR. EMERY MARVEL

By Dr. Wm. Edgar Darnall

DR. EMERY MARVEL, age fifty-one years, died in the Lankenau Hospital, Philadelphia, January 7, 1920. Dr. Marvel was born on a farm in Kent County, Del., and followed the life of a farmer until he was seventeen years of age. He attended school at Dover, Del., and later became a teacher. He then entered the Delaware State College. His medical course was obtained from the University of Pennsylvania from which he graduated in 1895.

After his graduation he served interneships in Howard Hospital, Philadelphia, and Cooper Hospital, Camden, N. J. He then came to Atlantic City and associated himself with his brother Dr. Philip Marvel.

Some years ago he became infected while performing an operation and suffered from a general septicemia. For a time his life was despaired of, but he eventually recovered. He established a private hospital and actively pursued the profession of surgery.

Feeling that his health was failing, last fall he entered the Lankenau Hospital, Philadelphia, and placed himself under the care of eminent physicians there who advised him to have a kidney removed for pyonephrosis. At the operation it was also discovered that he was suffering from acute lymphatic leucemia although blood studies had not previously revealed it. His fight was a brave and courageous one, but his health had been so undermined by his illness that he succumbed.

Dr. Marvel was devoted to his profession. He was deeply interested in public affairs and he was generously good to the indigent poor of the community. He was a Fellow of the American College of Surgeons, the American Medical Association, the State and County Medical Societies, and of this Association, and at one time was a member of the staff of the Atlantic City Hospital.

IN MEMORIAM

DR. XAVIER OSWALD WERDER

By Dr. Edward A. Weiss

DR. XAVIER OSWALD WERDER, whose life was one of zeal and devotion, died on November 20, 1919, following an illness of four days of pneumonia. Until a few days of his death he was in full vigor of health and his unexpected death was a great shock to his very large circle of friends and patients. Probably few men have been so generally loved and respected in his city as was Dr. Werder. His simple honesty, sterling character, and extreme modesty were characteristics of the man. He possessed a personality so full of Christian kindness and forbearance that it can be truthfully said that he never had an enemy. He judged his fellow-men with the greatest charity and his honesty of purpose dominated his every act.

Dr. Werder was born in Switzerland, Dec. 4, 1857. He attended the seminary at Einseideln and when he was twelve years old he came to America. For three years he attended St. Michael's Theological Seminary and St. Vincent College, but while an intensely religious man, he always looked forward to the study of medicine. He entered the Baltimore Medical School which he attended for two years and later graduated from the New York University Medical College in 1879. He located in Pittsburgh, but a few years later went abroad where he studied for two years in the clinics of Germany and Austria. Returning to Pittsburgh, he confined his work to gynecology which at this time was becoming recognized as a surgical specialty. His struggle for recognition during these formative years makes a most interesting chapter in his life, and in spite of almost insurmountable difficulties, he soon became a recognized authority.

During his professional life of forty years, he was loyal to the highest ideals of medicine and his dealings with his professional brethren typified his earnestness and sincerity. No one who has had the pleasure of working with him can forget the pattern of whole-soul devotion which he has left as an incentive to those who follow him. The home life of Dr. Werder was ideal in every respect, his gracious wife and eleven children affording him the greatest happiness and contentment. Those fortunate enough to enjoy the hospitality of his home were always impressed with his deep affection and kindly indulgence.

Dr. Xavier O. Werder.

He was elected Professor of Gynecology in the Medical School of the University of Pittsburgh in 1893. During the twenty-five years of his teaching he inspired his students by precept and example and he enjoyed their esteem and respect at all times. As a clinician, he taught the principles of surgery with simplicity and earnestness, at all times avoiding the spectacular. He encouraged his assistants and associates in any new endeavor or research and gave them his advice and suggestions with a whole heart. He never sought notoriety, in fact he shunned it with his characteristic modesty. The many positions of honor that he held were literally forced upon him. He served willingly and often with many charitable organizations and gave freely of his time and means. Only his most intimate associates knew of his liberality and generosity. Having tasted of poverty in his early years, he was particularly kind and indulgent to the poor student as many can testify.

In addition to being Professor of Gynecology, he was a member of the Faculty Council. He was gynecologist-in-chief to the Mercy Hospital of Pittsburgh continuously from 1890 to the time of his death. His work at this hospital was of such a character that his loss was felt equal to that of its sister institution, the Mercy Hospital in Chicago, when that other master-surgeon Dr. John B. Murphy died. He was also gynecologist to the Pittsburgh Hospital, and consultant to Rosalie Maternity Hospital, St. Francis Hospital and the South Side Hospital. In 1914 he was elected president of the Allegheny County Medical Society and was a founder of the American Association of Obstetricians and Gynecologists and its treasurer from 1888 to 1910 and elected to the presidency in 1911. He was also a member of the American Gynecological Society, the Southern Surgical and Gynecological Association and a Fellow of the American College of Surgeons.

Dr. Werder enjoyed a very large practice and was a gynecologist in the full sense of the word, devoting his work entirely to pelvic diseases. His many valuable contributions to gynecologic literature show his originality and thoroughness. The radical operation for cancer of the cervix as devised by him and published in 1898 was one of the most valuable contributions to gynecology. His igni-extirpation operation for cervical cancer was also noteworthy. Dr. Werder was always unselfish and took pleasure in giving credit to others. He kept faith with his God, with himself, and with his fellow-men. We might envy his host of warm friends and admirers, yet he never tried to make friends, he tried only to do friendly deeds. His life was the rounding out of all good human possibilities through conscientious endeavor, hard work and unselfish ideals.

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